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Building the Test Section of LIBERTY HIGHWAY

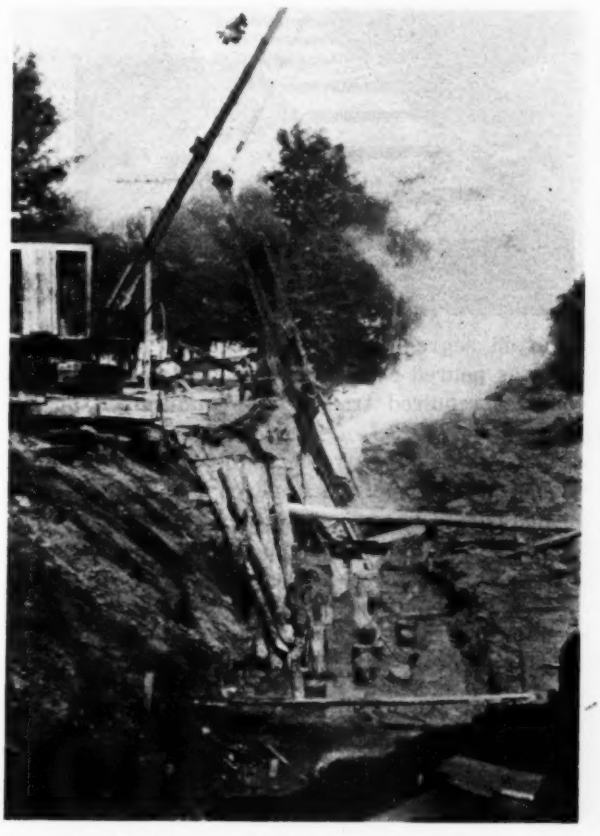
Contractor Peter J. Knickenberg turns out excellent job in record time on New York highway.

THE LIBERTY HIGHWAY, is the highway extending from Westfield, N. Y., on Lake Erie, to New York City and the "Test Section" is a six mile strip at Randolph, N. Y.

The contract which is one of those let under the Federal Aid Emergency Relief Act, calls for the widening to twenty feet and resurfacing with asphalt of two and one-half miles of road and the building of three and one-half miles of new reinforced concrete pavement twenty feet wide, together with three bridges and 60 structures.

The contract was let on June 15th to Peter J. Knickenberg, of Buffalo, and was completed December 15, 1931.

On July 1st, a Bucyrus-Erie Gas+Air 1-yard shovel and a Bucyrus-Erie 1035 were moved onto the job and excavation started. During the same week two crews started work on drainage structures, one crew laying pipe culverts and the other building concrete culverts. After the culverts were finished, the latter crew started the two smaller bridges on the contract.



A strata of quicksand added to the difficulties of driving these 35-foot batter piles. A perfect performance was given, however, by this seven-year-old Bucyrus-Erie Type B steamer using a McKiernan-Terry number seven steam hammer.

Half Widths Worked at a Time

On July 27th the work of pouring the concrete foundation for asphalt pavement began. A large part of this foundation was in the form of a strip of concrete two feet wide and nine inches thick along each side of the existing pavement. The problem of handling this narrow strip of excavation economically, was solved by using a Barber-Greene ditcher which "chewed up" the packed earth and gravel and loaded it into trucks, leaving the trench in such condition that very little labor was required to "fine grade" it for the concrete. A Ransome 27-E paver followed close behind the ditcher, discharging its mixed concrete into buggies for distribution. Buggies were used

Team work in handling 75-foot, 20-ton steel girders. In the foreground the Marion Type 450 gas-electric 1¼-yard . . . on the other end a Bucyrus-Erie 1035 straight gas ¾-yard.

to avoid segregation of aggregates. The widening was poured on only one side at a time as the contract required traffic to be maintained at all times.

There were two stretches of road, one a thousand feet and one five hundred feet long, where the old pavement was replaced by a full twenty foot width of new foundation on a new line and grade.

Both stretches were poured, half width at a time, and the five hundred foot strip, which was a grade change under a railroad was an especially difficult piece of work.

Quick Setting Cement Speeds Opening

The grade was lowered two feet and storm sewers laid. The subgrade was found to be blue clay, which was removed to an additional two feet and replaced with creek gravel. In order to maintain traffic, first one side was excavated, gravelled and opened to traffic; then the other half was excavated. In order to speed up the work and avoid having to wait ten days to open a strip of concrete to traffic, quick setting cement was used and the first half was thrown open to traffic two days after pouring and the entire width of road, which with ordinary cement would have been partly closed for at least twenty days, was entirely opened in five days.

When this tedious job of widening was completed and ready for asphalt, all attention was turned to the three and one-half miles of twenty-foot concrete road.

Old Pavement Broken with Skull Cracker

For the most part, this pavement was built over an old concrete pavement which was first broken up by a one-ton weight operated from the shovel boom of the Bucyrus-Erie 1035. The broken concrete was left in place as a foundation course and a three inch layer of fine gravel placed on top as a cushion and levelling course.

While this preparation of the subgrade was going on, the Bucyrus-Erie Gas+Air shovel was turning out gravelly material from a borrow pit to be distributed along the shoulders, so that when the first half of the pavement was opened to traffic, the material could be spread out, making a nine foot shoulder, which, together with the ten foot of concrete pavement, made a comfortable road for two lanes of traffic.

Pavement to Test Aggregates

On August 31st, concrete pavement operations began. This was considered the most important

Handling aggregate at the unloading plant with Marion gas-electric, Erie weighing aggremeter, and Bucyrus-Erie steam crane.

operation of the contract, as this three and one-half miles of concrete pavement was to serve as a test road to compare the durability of concrete aggregate commonly used in Western New York with aggregates known to have great durability.

The test section was built half width at a time. The north half was built entirely of Western New York materials, namely washed gravel from Franklinville, and washed sand from the Shore Acres pit at Bemus Point.

In the south half, the imported materials were used. The materials selected for the test were Long Island sand, which has a very high quartz

content, and trap rock, from the greater New York district, having a very high resistance to wear.

One section was built using Long Island sand and trap rock, one using Shore Acres sand and trap rock and a third using Long Island sand and Franklinville gravel. Between each of these sections was a section using Shore Acres sand and Franklinville gravel.

Erie Weighing Aggremeter Proportions Materials

Great care was exercised in proportioning the materials. The coarse aggregate, which was separated into two sizes, and the sand, were weighed out by an Erie weighing aggremeter, according to proportions fixed by the State's Material Engineer. In order to obtain a uniform moisture content in the sand, the contract required it to be stocked for twelve hours before using. This made two sand stock piles necessary.

The available ground for stock piles left little choice of plant layout. The plan decided on was a circle, at the center of which was located the Marion gas-electric crane with 45 foot boom, setting on a mound four feet above the general level. Around the circumference of the circle were arranged—two 10'x10'x10' concrete unloading pits, under the railroad siding; four stock piles of four car capacity each for sand and gravel and the Erie weighing aggremeter.

Cement was dumped directly from cars into steel batch boxes, three hauled by each truck.

On the road, the batches were handled by the Ransome 27-E paver. As the mixed concrete came from the bucket distributor, it was struck off two inches below the top of the forms by a wooden template worked by two men. As soon as the bar mat reinforcement was placed and the final two inches of concrete distributed, it was struck off to true surface by a Blaw-Knox "Ord" finisher. After this came two men with a twelve foot longitudinal float and then the finishers who gave the pavement the final "trueing up" and edged and broomed it. The three and one-half miles of pavement were poured in thirty days.

The State Department of Public Works maintained a field laboratory on the job and tests were made constantly to control quality of the aggregates and to insure a uniform mix of concrete.

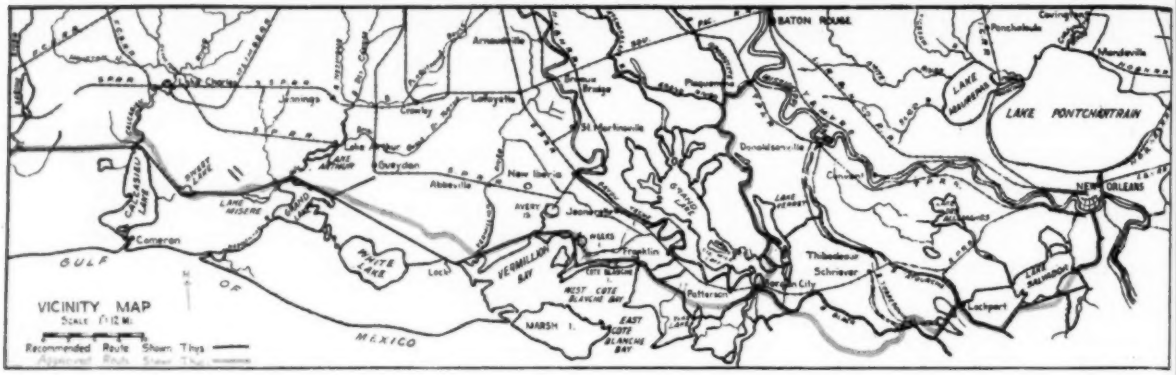
Bridge Important Item

The final stage of the job along with the trimming of shoulders and ditches, was the construction, in the village of East Randolph, of a seventy-five foot span plate girder bridge with a forty foot clear roadway and two five-foot sidewalks. Also a temporary bridge was built to maintain two way traffic.

After the old bridge was removed and the excavation completed, the next step was to drive steel sheet piling to maintain the embankment at buildings and at the temporary roadway. For this operation a McKiernan-Terry No. 7 steam hammer

(Continued on page 166)

Excavating in one of the heavier cuts with Bucyrus-Erie Gas+Air



Progress on the Intracoastal Waterway

Work underway involves excavation of over 75,845,000 yards, largely dredging

THE Louisiana and Texas Intracoastal Waterway as authorized by Congress under the River and Harbor Acts of March 3, 1925, and January 21, 1927, provides for a channel 9 feet deep at Mean Low Gulf, over a bottom width of 100 feet from the Mississippi River, at or near New Orleans, Louisiana, via two routes to Morgan City, Louisiana, thence by one route to Corpus Christi, Texas.

The section from New Orleans, Louisiana, to Sabine River, Texas, is within the First New Orleans District, under Major R. F. Fowler, Corps of Engineers, U.S.A., District Engineer, and under the direct supervision of W. B. Smith, Senior Engineer.

The section from the Sabine River to Corpus Christi is under Major Milo P. Fox, Corps of Engineers, U.S.A., Dist. Engineer, Galveston district.

Plaquemine-Morgan City Section of the Canal through Flat Lake. Brush dikes were constructed by Government plant and hired labor to prevent soft material being washed into the channel and also protect the spoil banks from erosion by wave action.

The status of the work in the First New Orleans District as outlined by Major Fowler is as follows:

Mississippi River—Atchafalaya River Section

Work on the Plaquemine—Morgan City alternate route is being done with the United States 16-inch pipe line dredge "Indiana." This dredge is moving about 80,000 cubic yards per month. There is an available channel 8 feet deep and 60 feet wide throughout. The work, which involves removal of 532,000 cubic yards of material, will be completed to full project dimensions about September 1, 1932.

A contract has been awarded to C. F. Lytle of Sioux City, Iowa, for clearing the site, constructing sheet pile cofferdam, making the excavation, driving the foundation piling and sheet pile cut-off walls, and constructing the concrete lock walls and flooring for the Harvey Lock at the Mississippi River entrance to the canal. Excavation on this contract totals 158,800 cubic yards. The contract for the fixed irons, gates, etc., for Harvey Lock was awarded the Hardie-Tynes Manufacturing Company of Birmingham, Alabama, for $193,775.44. The Harvey Lock is under the direct supervision of Herbert L. Williams, Civil Engineer.

Standard Dredging Company of New York, was awarded the contract for the portion of the Harvey Route from Harvey to Bayou Blue. This was awarded on the December 15th, 1931 bidding for 6.29c per cubic yard. The estimated yardage on this section is 6,554,000 cubic yards.

The remaining portion of the Harvey Route from Bayou Blue to the Atchafalya River is under contract with the McWilliams Dredging Company of New Orleans, Louisiana, for dredging about 8,744,600 cubic yards of earth excavation at 6.46 cents. The contractor started work with a 20-inch hydraulic dredge on October 26, 1931, and has completed about 11% of the contract. It is the intention to put on additional dredges at a later date.

Atchafalya River—Vermilion River Section

The portion of this section from the Atchafalya River to Bayou Gregorie is under contract with the McWilliams Dredging Company of New Orleans for

dredging 4,988,800 cubic yards of earth excavation at 6.6 cents per cubic yard.

The contractor started work with a 16-inch hydraulic Diesel dredge on September 25, 1931, and expects to put on additional plant later. The contract is about 14% completed.

The remaining portion of this section from Bayou Gregorie to Vermilion River is under contract to the Orleans Dredging Company of New Orleans for dredging about 8,819,000 cubic yards of earth excavation at 7.8 cents per cubic yard. The contractor has used a 3½-cubic yard dipper-dredge, a 3½ cubic yard clamshell dredge and a 22-inch hydraulic dredge on this work. The contract is about 60% completed.

Vermilion River—Mermentau River Section

This section is under contract with the Sternberg Dredging Company at St. Louis for dredging about 10,875,000 cubic yards of earth excavation at 7.48 cents per cubic yard. The contractor used 2½-cubic yard dipper dredges, 3-cubic yard California-type clamshell dredges, 2½-cubic yard dragline dredges on barges and 14-inch hydraulic dredges. The contract is about 98% completed.

Mermentau River—Calcasieu River Section

This section is under contract with the Clark Dredging Company of Miami, Florida, for dredging about 8,208,000 cubic yards of earth excavation at 5.769 cents per cubic yard. The contract is about 96% completed.

Calcasieu River—Sabine River Section

This section was completed by the Government under contract in 1925 and enlarged by the Parish of Calcasieu to a 30 by 125-foot canal in 1927.

A contract was awarded to the Moore Construction Company of Liberty, Mississippi, for raising the tracks and constructing a siding at the Bayou Sale R. R. bridge crossing, for $7,850.

Galveston District Operations

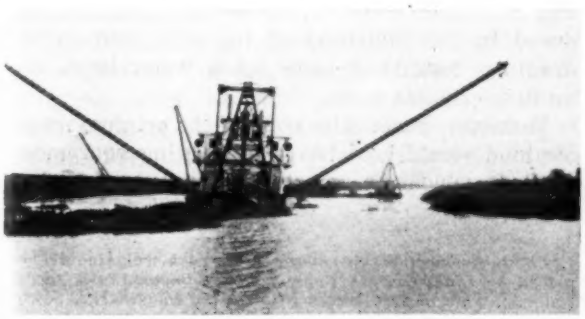
In the Galveston district, handled under the supervision of Major Fox, progress is reported as follows: contracts have been let to Standard Dredging Company of Galveston and The Atlantic, Gulf and Pacific Company of New York, and dredging work is underway covering all of the Sabine River —Galveston Bay Section of the waterway except two gaps of about one mile each. The length of the waterway under contract is about 57.9 miles, involving the removal of 16,965,500 cubic yards.

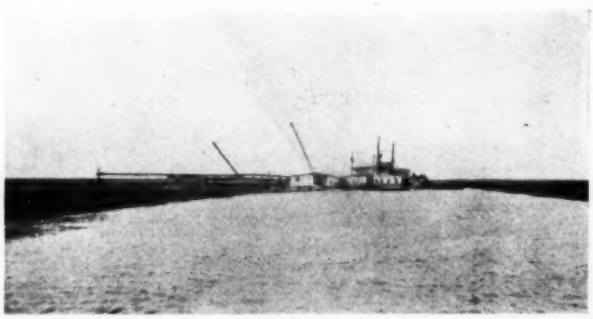
The two gaps not under contract are a reach of about one mile at the crossing of the Gulf and Interstate Railway near High Island, Texas, and about one mile at the crossing of the Sabine-Port Arthur highway and Texas and New Orleans Railroad near Port Arthur, Texas. An agreement with the Gulf and Interstate Railway is being prepared covering the construction of a railway bascule bridge over the waterway near High Island. Recently the Interstate Commerce Commission granted authority to the Texas and New Orleans Railroad to abandon their track from Port Arthur to Sabine, Texas. Jefferson County, Texas has been requested to construct a highway bridge across the waterway. This will eliminate the necessity for building a large combined railway and highway bridge and should expedite the completion of the waterway.

Section of canal from Vermilion River to Mermentau River being dredged by clamshell and dipper dredges. Two pilot cuts are made by dipper and clamshell dredges and later completed by removing the center core and deepening with dragline machines on barges and also by hydraulic dredges. Contract with the Sternberg Dredging Company of St. Louis, Mo.

All local co-operation has been met except the construction of the highway bridge south of Port Arthur.

(Continued on page 166)





McWilliams Dredging Company's dredge Gulfport working on the Bayou Blue-Atchafalaya Section of the Intracoastal Waterway. Left: Note the arrangement for handling swinging anchors with booms placed on the forward deck of the dredge. Right: This shows the suspended discharge pipe to avoid laying shore pipe. This discharge pipe is suspended from the deck of a large barge which moves along with the dredge.

Granular Slag Used fill Mud in New Jersey

William Eisenberg & Sons with Li[illegible]th difficulties of excav[illegible]Je

By Spencer A. Jones

NEW JERSEY has reason to be justly proud of her highway system, and particularly of the conception and planning of Route 25. This magnificent stretch of pavement extends from the New Jersey mouth of the Holland Tunnel in Jersey City to the Camden-Philadelphia bridge.

Intersections of other highways with Route 25 have been the subjects of careful consideration by the State Highway Commissioners and Jacob L. Bauer, State Highway Engineer. One of these intersections is the famous "Clover Leaf" near Woodbridge, where free traffic flow is provided for two of New Jersey's most heavily traveled state highways.

No intersection, however, has been quite such an excavation-and-fill problem as the junction of Routes 21 and 29 with Route 25. This is because Newark Junction, as the intersection is called, is located on the "Jersey Meadows" east of Newark, New Jersey.

Twenty feet of garbage and muck

The "geological" structure at Newark Junction consists of 8 or 10 feet of garbage resting on 10 feet of soft mud, which in turn, rests on clay hard-pan. The ground water level, as shown by the illustrations, is about 2 feet below the top of the mud and is plentifully supplied by Peddie Ditch.

The specifications called for a solid fill with a 1½ to 1 slope. This necessitated wide trenches through the garbage and mud down to hard-pan. The resulting "soup" in these wide trenches, produced by the churning of the soft mud as the draglines took their bites below water level, was an indescribable mess.

Moreover, practically none of the original meadow mud would hold heavy excavating equipment, so the problem became the triple one of finding

1. Thirty-two sections of concrete pipe each weighing 12 tons were placed by Linde-Griffith Construction Company in a race against time. 2. This picture leaves little to the imagination . . . garbage in the background, soupy mud in the middle separated from the slag fill on the left by more soup. 3. 42-B steamer with Union hammer puts down the piling. 4. Gas+Air digging in the muck. In the back-ground Mack trucks dump loads of slag for the Caterpillar bulldozer to spread.

ll to Displace Fluid

uper-Highway Junction

ith Construction Company overcome
Jersey Meadows."

a substantial filling material at an economical distance that would force out fluid mud from the hard-pan and provide a safe support for excavating equipment of any weight, as well as a usable driving surface for trucks.

Available rock was too far away and in addition would have to be crushed to provide a practicable driveway for trucks, which put it out of the question.

Finally A. Eisenberg, treasurer of William Eisenberg & Sons, of Camden, contractors for the entire job, solved the problem in a simple and effective manner. He discovered a granular slag composed of particles about the size of rock salt at the Balbach Plant of the United States Metals Refining Company, about 3½ miles away from Newark Junction.

This slag, which weighs 3400 pounds per cubic yard, he found would cut through the soupy, fluid mud and drive it away from the clay hard-pan; was within practicable hauling distance; needed no crushing or other preparation; easily supported his heaviest excavating equipment and packed down to form a splendid roadway for his dump trucks.

Thirty 7-yard Macks per hour loaded with heavy slag

A 37-B Bucyrus-Erie shoveled the granular slag from the slag dump at the smelter into 7-yard dump trucks, mostly Macks, at the rate of 30 truckloads per hour throughout a 9-hour day.

William Eisenberg & Sons, of Camden, signed the contract for the Newark Junction on May 23rd, 1931, at a contract price of $576,603. Linde-Griffith Construction Company, of Newark, was sub-contractor for the bridge, culvert and pipe extension work, amounting to $145,603. A brief description of the speed with which 120 feet of 90-inch pre-cast concrete pipe was laid by Linde-

(Continued on page 143)

5. This picture shows the depth of the old garbage fill with the 37-B in the background. 6. Loading granular slag into 7-yard trucks with the 37-B 1½-yard shovel. An average of 30 truck loads per hour was the neat output in this "borrow pit". 7. In the foreground the Gas + Air dragline is loading "soup" to trucks while in the background the 37-B dragline is casting the mess to one side. 8. Another picture showing the Gas + Air dragline loading to trucks.

Fairfax Construction Company tames Birmingham Creeks

Congested areas and flood waters tax skill of contractor in pushing through difficult job

THE CITY OF BIRMINGHAM, Alabama, has undertaken an extensive drainage improvement program to eliminate flood water difficulties which have been experienced in certain parts of the town due to overflow of Village and Valley creeks. A glance at the map will show that these two creeks run more or less from the eastern towards the western end of the city. Village Creek is an open channel through its course. A part of Valley Creek is now carried through an underground channel.

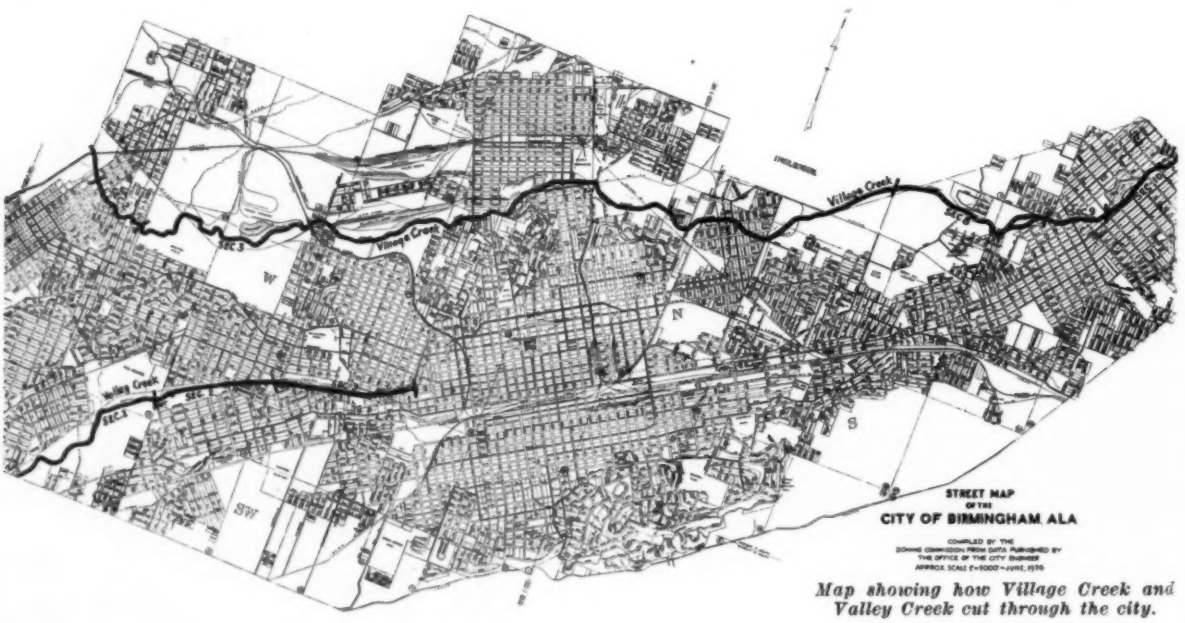
This article deals with the work being done on Sections 2 and 3 of Valley Creek by the Fairfax Construction Company of Birmingham, and will give a brief description of the character of the work and the method used in handling it.

From the map you will note that this part of the work lies in a rather thickly settled part of Birmingham. Numerous obstacles, such as bridges, sewer lines, nearby buildings, etc., tended to delay operations and made the work more difficult than the average drainage job. Special care had to be taken in blasting to prevent damage to nearby structures. Besides this, Valley Creek is subject to frequent and rapid rises whenever a heavy rain occurs. In spite of all these unfavorable factors a fair rate of progress has been maintained due to the skill and untiring effort on the part of the contractor.

Note the pipeline in the foreground. Blasting and excavating was considerable complicated by such obstructions.

71,000 Yards Rock, 170,000 Yards Earth

Section 2 involves about 50,000 cubic yards of rock excavation and about 100,000 yards of earth excavation. Section 3 involves about 21,000 cubic



Map showing how Village Creek and Valley Creek cut through the city.

Restrictions in blasting operations due to adjacent buildings, pipelines, etc., resulted in increasing the large rocks.

Looking down the trench where the rock was later buried with a layer of earth.

The rock pans were five feet square by fifteen inches deep and carried three tons of rock.

yards of rock and 70,000 yards of earth excavation. The work consists of enlarging, deepening and in some cases relocating the present creek bed. The new channel has a bottom width of 70 feet at the lower end of Section 2, and 47 feet at the upper end of Section 3 where it joins the underground channel. The earth excavation varies from zero to 8 feet in depth and the rock from zero to 6 feet in depth. Disposal of the excavated material is one of the difficult features of this work and the contract requires that all rock removed must be placed in low places and covered with 18 inches of earth.

In some cases the material can be deposited in low places and the owners of nearby property are usually glad to have their property elevated with earth. In many cases it has been necessary to excavate a trench parallel to the new channel, placing the surplus rock in this and recovering with earth.

Work was started on Section 2 about August 15. The stripping was done with two Link-Belt K-44 gasoline draglines which were shipped in from Missouri. Contract for Section 3 was secured several months afterwards.

Briefly the method of operation followed was to strip the earth from the rock which was then drilled and shot and handled afterward. As this is written all of the earth has been stripped and only a small amount of rock remains to be taken from Section 2. Drilling is under way on Section 3.

Shovel Found Most Satisfactory for Handling Rock

In order to handle the blasted rock a grapple bucket with points was first used with one of the draglines. It was found that the rock broke in such large sizes that the grapple could not handle it successfully. In order to load the rock it was decided to place a 1½ yard caterpillar—mounted steam shovel in the channel and load into skips. A 42-B Bucyrus-Erie 1½ yard steam shovel was purchased for this operation. The rock pans are 5 feet by 5 feet by 15 inches and carry about three tons of rock. These are picked up by one of the draglines standing on the bank above and swung over to the trench previously dug for disposal of the rock.

In order to secure greater output in the rock work a narrow gauge Industrial railroad outfit consisting of three 20-ton dinkeys and five 4-yard cars per train has been installed. This equipment has proved quite satisfactory and has enabled the contractors to secure greater output from the 42-B. For disposing of the surplus earth a tractor outfit consisting of three 7-yard Euclid wagons with Caterpillar 60 tractors is being used.

President S. J. Peterson and Superintendent J. H. Ball.

Rock Cleaned Hydraulically Before Blasting

The rock is being drilled by ten jackhammers. Air is furnished by a centrally located compressor plant consisting of one 265-cubic-foot Ingersoll-Rand compressor and one 846-cubic-foot Gardner compressor. These compressors are steam driven and are located near the center of the work. In order to prevent splattering of mud when blasting it has been found helpful to use a portable Worth-

(Continued on page 168)

Looking down the section of the creek after completion of the stripping operation.

Loading out the rock to pans which are dumped into the prepared trench adjoining.

Here the stream is flowing through its new channel. Note rock strata along bank.

George Washington, the Canal Builder

Ruins of Canal Built by Washington Included in Park Area

By M. F. Anderson

THE "Potowmack Canal," built under the direction of George Washington, to provide river traffic accommodations around Great Fall above Washington City, is included in a park area development made possible by the Crampton-Capper bill passed by last Congress.

The Potowmack Canal was a project that occupied Washington's attention early in life. He considered such a canal a logical connection between the Atlantic seaboard and the region west of the Appalachains, and believed that it was destined to become a trade route of first importance. While the canal was never used for the river traffic that he envisioned, several decades after his death the Baltimore and Ohio Railroad was built along the course of the Potomac river, fulfilling in many ways Washington's idea of a commercial highway between the Ohio valley and the tidewater regions of Virginia and Maryland.

Ruins of old locks on canal at Great Falls, the canal was built under the direction of George Washington as part of a project in which he was interested all his life to make of the Potomac River a waterway for traffic between the Atlantic and the region west of the mountains.

Thirty or forty acres of land have been secured in the upper Potomac section where the locks of the old canal are located. This will be a part of the memorial park system which is to be opened in time for the Washington Bicentennial in 1932.

Walls Excellently Preserved

The stone walls of the canal are still in a fine state of preservation and are of special interest because they are a part of an engineering project which occupied much of Washington's consideration from the time that he was a youth until the time that the canal was completed just a few years before his death. The stone blocks in the walls reveal beautiful tool work, while the masonry bears evidence that it was most carefully constructed.

Washington's interest in the navigation of the upper Potomac dates back to 1748, when as a mere stripling, he surveyed an immense tract of the Shenandoah region for Lord Fairfax. His interest was again aroused when he visited Thomas Cresap at the time he was actively engaged in the organization of the Ohio Company. A bill sponsored by Washington authorizing the building of a canal to connect the Atlantic and the Ohio was passed by the Virginia Assembly in 1772. The work was cut short in 1774 by the Revolution.

Canal Company Organized in 1785

It was not until after the Revolution that definite legislation was secured in Maryland to justify a continuation of the work. In 1785 the Potowmack Canal Company was officially organized and Washington was made its first president. He spent a great deal of his time on inspection trips along the river in August, 1785. In February, 1786 work was actually begun on the locks on the Virginia side at Great Falls with James Rumsey in charge. Meetings with Washington on the spot are reported for three days in March, for two days in October, and at other times, and the first annual report of the company, in Washington's own hand, was written on August, 17, 1786. At this time 200 men were employed.

During the following years progress was slow, due to lack of funds, labor difficulties, and lack of engineering experiences. This was a novel work in this country and all pioneer engineering. By 1795 the locks and works at Little Falls were reported as completed and the channel cleared between that place and Great Falls. Ten pounds sterling was called on the new shares. Renewed vigor was put into the directory and two of them made a close inspection of the river from Cumberland down. Workmen were employed at many places, but still an experienced engineer was badly needed at Great Falls in the erection of the large locks.

In July 1796 a market house, thirty by fourteen feet, was built at Matildaville (a town laid out at Great Falls). There was another call for twenty percent on new shares. The breadth of the locks at Great Falls was extended from twelve feet to fourteen. More Irish laborers (possible redemptioners) were bought in Baltimore on a credit of sixty days.

Tobias Lear (Washington's secretary) was in August elected president, with Keith, Templeman, Fendall, and John Mason directors.

The three locks at the Little Falls of the Potomac were first constructed. They were made 18 feet wide and of wood. The next finished was the upper lock at Great Falls—this was made 14 feet wide. A little further experience satisfied the Directors that width of 12 feet was sufficient for any vessel that would navigate the river, and so this size was used on all the locks that followed. The 14-foot upper lock at Great Falls with its greater capacity aided by an adjoining basin, was made to serve to fill more readily the lower locks. At Little Falls it was proposed when the wood might decay to rebuild these locks of granite (of which there was a quarry belonging to the Company of excellent quality on the canal just above) and at that time narrow them to 12 feet in width.

At this time it was thought that in the labor applied to the bed of the river too much had been done in removing rocks and that obstructions to the passing off of the water had sometimes been mistaken for obstruction to navigation.

On the Potomac at the lower extremity of the canals at the Great Falls were five locks described as follows: "Dimensions—one, length 100 feet, width 14 feet, lift 10 feet, contents 18,200 cubic feet—construction, rectangular, walled with hewn free stone, sluice gates discharge thro' the larger gates,—one, length 100 feet, width 12 feet, lift 16 feet, contents 22,800 cubic feet, construction rectangular of hewn stone, sluice gates as before described,—one, length 100 feet, width 12 feet, lift 14 feet, contents 20,400 cubic feet, construction as the last—two, length 100 feet, width 12 feet, lift 18 feet, contents 25,200 cubic feet each, construction rectangular, blown out of solid rock, the natural rock worked tolerably smooth forming the sides, some mason work being used where the fixture are inserted for supporting the gates, the sluice gates in these locks as in several of the others that are deep, do not lift but are made of cast iron and turn on a pivot fixed in the center, so that when the sluice is open the little gate or stopper is turned edgewise to the stream, they work very easy and are managed in deep locks much more readily than those of ordinary construction.

"At tide water, at the canal at Little Falls, three [locks]—dimensions, length 100 feet, width 18 feet, lift 11 feet, contents 23,400 cubic feet each, construction of wood, rectangular—sluice gates discharge as described for those at Great Falls."

Washington Invested $10,000 in the Project

Ample evidence of the interest Washington took in the enterprise and the personal supervision he gave the work of construction is contained in many entries in his diaries, too long to quote here. He put into the enterprise more than $10,000 of his own, a material indication of confidence in its economic soundness, but he never accepted any pay for his services.

Washington's interest in the James River project was never equal to that in the Potomac and he does not seem to have given it the same personal attention, although both had the same all-important purpose. He wrote to Edmund Randolph, August 13, 1785: "The great object, for the accomplishment of which I wish to see the inland navigation of the rivers Potomac and James improved and extended, is to connect the Western Territory with the Atlantic States; all others with me, are secondary. Tho' I am clearly of the opinion that it will greatly increase our commerce & be of an immense saving, in the article of transportation & draft cattle, to the Planters & Farmers who are in a situation to have the produce of their labor water borne."

It is therefore, not without justification that Whitford, in his *History of the Canal System of New York*, wrote: "The immortal Washington was the original father and promoter of these canals and improvements, and well did he deserve that admirable motto—'Twice the saviour of his country.' After conducting her to liberty, he opened her the way to prosperity by new roads and canals, and varying the produce of agriculture." Part of the Potomac Canal trench and the ruins of the locks remain to this day near the Great Falls of the Potomac to bear witness to George Washington's practical work as an engineer—a monument to amaze future generations by the difficulties overcome with such scant means—and to the importance he set upon improved lines of communication between the Atlantic seaboard and the great undeveloped West as the permanent and most effectual way of achieving "a more perfect union."

THE STEAM SHOVEL

While others travel brighter roads
And live through gayer days,
The old steam shovel bears its loads
And toils through prosy days.
While heroes in procession ride,
And bands of music play,
Unconscious of Earth's pomp and pride,
It calmly digs away.

There's lots of shoveling to do
Through this world's rock and loam,
Through many a swamp and mountain, too.
E'er better days come home.
We shall need men who do not care
For pomp and cheap display,
But take Life's humble thoroughfare
And calmly dig away.

—Clarence Edwin Flynn.

THE EXCAVATING ENGINEER
FOUNDED 1905

A Monthly Publication Devoted to Excavating and Allied Subjects

REGULAR SUBSCRIPTION: $1.00 a year for 12 months.
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The Business Situation

THE most encouraging sign today, and it is a very important one, is the slight decrease in the amount of money in circulation. An unusual rise in "money in circulation" indicates the hoarding of currency for the term does not mean that the money is changing hands every day but rather that the amount has been placed in circulation by the Federal Reserve banks and the Treasury for the use of transacting of every-day business.

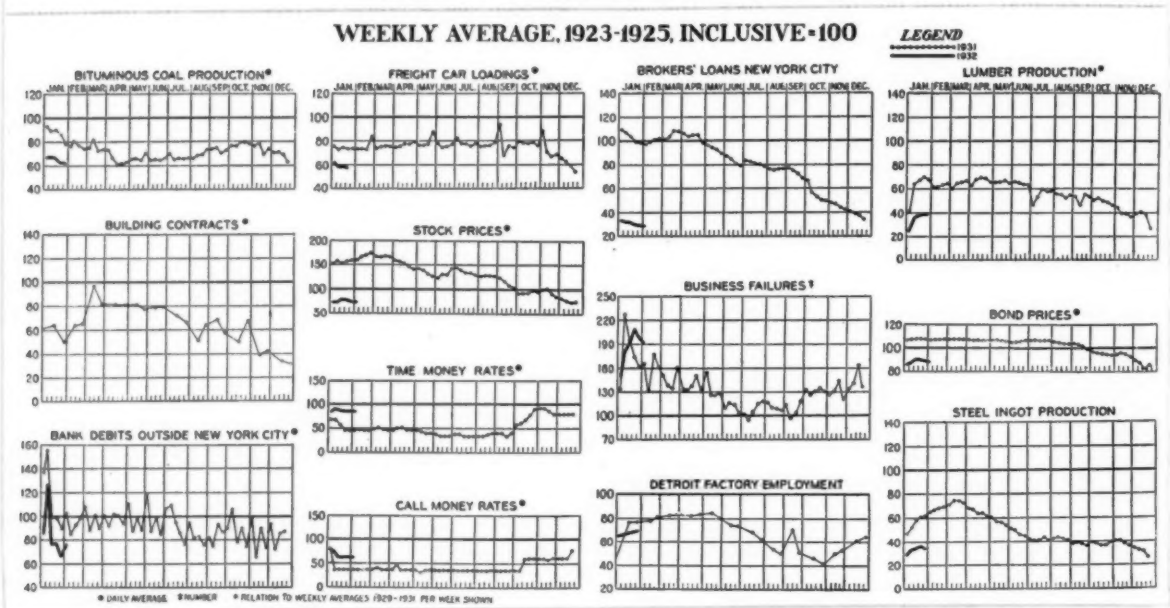
When the public loses faith in credit it not only hoards money itself but forces the banks of the country to hold currency on hand against the possible demands of depositors. The decrease in money in circulation means decreased hoarding and a more healthy state of mind on the part of the United States people. We quote as follows from a release of the *Central Republic Bank and Trust Company* of Chicago which brings out the present situation in interesting detail.

"We find ourselves with billions of dollars of gold and other forms of money for which we have no use. We are suffering more from idle money than from any other one thing. We have been keeping it idle by hoarding it, and this hoarding has been done no more by individuals than by banking institutions. Banks have been compelled to pay an abnormal amount of cash in meeting the sudden demands of depositors while, at the same time, they were forced to hold in their vaults hundreds of millions more, in order that other depositors might be provided with additional cash whenever they demanded it.

"The figures representing the dollar volume of commercial and financial operations prove that we require less money to handle our business now than was required a year ago, and yet we have in circulation almost a billion more. The release of this billion dollars would spell a return to prosperity within a reasonable time. It is to be regretted that the people who have this billion dollars do not realize that it is not the financial condition of Europe but the contents of teapots, tomato cans, and safe deposit boxes which prevent a return to sanity, and to normal business. Allowing for the difference in prices, we have nearly twice as much money in circulation today as we had on May 1, 1920, the peak of the immediate post-war spending orgy. The total stock of money in the United States at the close of the year 1920 was 8,373 million dollars, a year-end high, and our stock of money on the first of December was 9,212 million dollars.

"Just a few weeks ago many people were concerned over our sudden loss of 700 million dollars of gold. Our gold stocks on the first of December showed a gain of 119 million dollars over November first and were 3% below a year ago, with promise that the month of December will show further accretions to our hoard of gold. We have more gold than we need, more gold than we want, and the

WEEKLY BUSINESS INDICATORS



release of hundreds of millions to other countries of the world would re-establish their buying power as to assure material gains in our merchandise exports.

"The business of 1932 depends upon each one of us. If we will take that billion dollars out of its hiding places, and select a good sound bank in which to deposit it, we will so relieve the credit strain, and so lift the mental depression of the people, including our own selves, as to insure a liberal step-up in business volume during the early weeks of 1932, and a general easing of world conditions which will surely reflect itself in our international trade, and in world prices. When this billion has been released, it will no longer be necessary for the banks of the country to hold still another billion in their vaults in preparation for demands of anxious depositors. And thus, the release of this two billion dollars will set this country financially afloat in smooth waters, and ease the financial troubles of the whole world.

"The year 1932 will be what we make it."

Announcements of January construction contract totals by *F. W. Dodge Corporation* are accompanied by observations on wage adjustments now going forward, these being taken as a favorable sign.

"Recent action in New York City looking toward adjustment of union wage scales is an evidence that all departments of the industry are getting to the bedrock basis essential to recovery," the bulletin reads. "In a growing number of localities the question of building-wage adjustments is being squarely faced. In fact in about 15 cities of 100,000 or more inhabitants wage adjustments have already been amicably effected. In most of these cities other needed deflation has already taken place; hence these cities are likely to show first signs of revival."

A low construction contract total for January is reported in the 37 states east of the Rockies, but statisticians of the Dodge Corporation do not find the $84,798,400 total for the month surprising in view of the retarding influences at work in this as in all businesses.

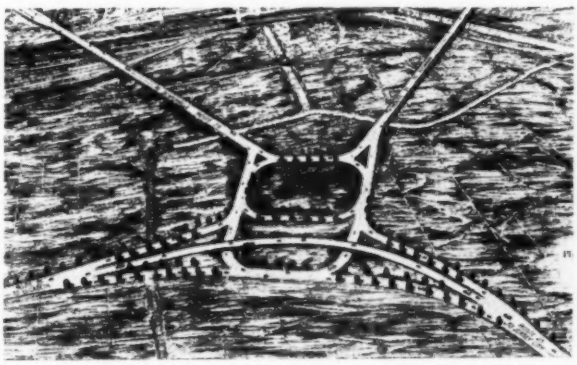
Of this $84,798,400 total, $27,504,300 was in residential building; $33,237,700 was in non-residential building; and $24,056,400 was in public works and utilities contracts. The marked decline in this latter class is, to quote the bulletin, "closely tied up with the current wave of budget-cutting on the part of municipalities and other public bodies. While this has a depressing effect on current operations, it is actually one of the last steps in the long chain of cost deflation, debt deflation, and real estate deflation that the country has had to undergo. Since it appears necessary to go through these disagreeable operations, it is best to consider the process much as a dose of medicine, the sooner taken the better the patient's chances for recovery."

In the various districts comprising the 37 states Dodge territory, the largest total, although low when compared with previous Januarys, was that for Metropolitan New York where $20,436,800 in construction contracts was reported during the month. Contracts amounted to $12,955,800 in the Middle Atlantic States.

New England and the section known as the Pittsburgh territory (Western Pennsylvania, West Virginia, Ohio and Kentucky) were nearly even with $7,589,200 reported in the first named and $7,517,600 in the latter. In both the Kansas City territory (Western Missouri, Kansas, Oklahoma, and Nebraska) and in the St. Louis district a total of somewhat over $4,000,000 was reported. The St. Louis territory is comprised of Southern Illinois, Eastern Missouri, Northeast Arkansas, Western Tennessee, and Northwest Mississippi.

Granular Slag Solves Difficult Problem in Construction of Important New Jersey Highway Intersection

(Continued from page 137)



Reproduction of artist's sketch showing the proposed highway junction of Routes 21, 25 and 29.

Griffith Construction Company with C. E. Ryan, vice-president, in charge, was given in *The Excavating Engineer* for *October, 1931*, page 500.

Total excavation 702,077 yards

Linde-Griffith Construction Company's equipment included a 42-B Bucyrus-Erie with a 1½-yard clamshell, and also rigged up as a pile driver; a ¾-yard Bucyrus-Erie shovel; and a pile-driver and stationary engine on skids.

William Eisenberg & Sons' equipment included a GA-2 Bucyrus-Erie of 1¼-yard capacity on dragline and shovel; a 37-B Bucyrus-Erie of 1½-yard capacity on dragline and shovel. Scraping, grading and general "shoving around" was handled by three 60 and one 15 Caterpillar tractors. A Rogers Brothers 8-wheel, 4-axle trailer of 45-ton capacity was used for moving heavy equipment along public highways.

The contract called for 5,757 cubic yards of earth excavation; 298,079 cubic yards of unclassified wet excavation (a mixture of soft mud and garbage); and 398,241 cubic yards of borrow.

The paving contract on Route 25 was sublet to Petrozelli Brothers, of South Orange, and is practically completed.

O. P. Vogel, resident engineer at the job for the New Jersey State Highway Department, states that the work has progressed according to schedule and that by the time this article appears the Newark Junction will probably be completed.

FIELD NOTES

Course in Estimating Construction Costs

FOR men interested in preparing estimates of construction costs, a new course has been introduced by the University of Wisconsin Extension Division at Madison. In 20 assignments, this course, called "Estimating Construction Costs," will be offered to students in any state by correspondence study. It is intended for contractors and others doing construction work, estimators, engineers, architects, and designers.

Professor H. E. Pulver, of the department of civil and structural engineering, who conducts this course, places the emphasis on correct methods of estimating the various types and kinds of materials, labor, and equipment required in construction work.

"The student is taught how to prepare estimates from charts given in the text and supplementary material," says Professor Pulver. "He is also taught how to construct the charts so that he may be able to draw charts for his own cost data. This method of estimating, while comparatively new, is believed to provide a means of estimating construction costs with the least effort."

Topics treated include transportation and handling of materials; excavation; piling; concrete; wood construction; brick, tile, stone; structural steel; lathing; plastering; roofing, flashing, waterproofing; pipe work and heating; plumbing; electrical work; painting and glazing; paper-hanging; machinery and its erection; overhead; estimating; prices of construction; and construction management.

The cost of the course is $20 for Wisconsin students; $26 for out-of-state students.

Grading Contractor's Obligation

A READER of *The Excavating Engineer* raises an interesting question concerning the work to be done by a grading subcontractor.

The site is being graded for landscaping purposes and was formerly occupied by buildings, paved streets, etc. The contract and subcontract call for "grading to within 2½ inches of the contour map, but mention nothing about the *character* of the surface. The subcontractor claims completion although considerable rock, brick, broken concrete are strewn about over, but within 2½ inches of, the surface limits." The completed surface is to be covered with one foot of soil for seeding—a matter in which the subcontractor is not directly interested.

"Under such conditions," asks our correspondent, "can the subcontractor be held to clean up all projecting or exposed rock, broken concrete, brick, etc.?"

In my opinion, our reader has been correctly advised: "There is no reason for holding the subcontractor. If he was expected to clean up bricks, masonry, etc., from the surface, this should have been specifically mentioned in the contract."

As we understand a more particular statement of the facts than is repeated above, the nature of the site was such that grading to the required level would naturally result in masonry debris, etc., getting mixed with the soil. From that fact and the further fact that the surface is to be covered with a foot of soil, we fail to see any basis for holding that the subcontractor has not fulfilled his contract. The debris mixed with the soil must have been mutually understood as being a part of the soil to be graded, in the absence of specification to the contrary. And an assumption that such was the understanding is fortified by the fact that one foot of soil is to be added to the surface as graded. A different situation might have been presented had it been contemplated by the contractor and the subcontractor that the grade to be constructed by the latter would be seeded.

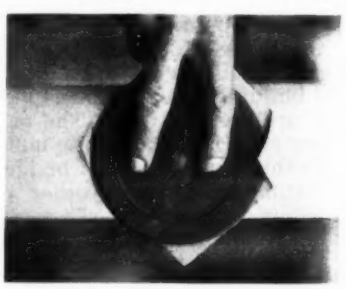
Our view of the matter is further fortified by the fact that performance of the contract necessitated some rock cutting to bring the surface to grade.

It has been frequently declared by the courts that the test of performance of a contract is whether the contractor or subcontractor has done his work according to plans and specifications—not results. To illustrate, we cite the decision of the Massachusetts Supreme Judicial Court in the case of Duncan v. Cordley, 85 N. E. 697. The court said that one who contracted to grade a street to a certain level fulfilled his contract when he completed the work to that level, although it later subsided, because of the nature of the soil or action of the elements.

A. L. H. Street, Attorney-at-Law.

Makes Handy Aid with Sandpaper on Round Surfaces

SQUARES of light sandpaper or emery cloth are by no means an easy thing for the fingers and hand to work with over round surfaces. Get one of the common inexpensive rubber suction sink stoppers. Cut the squares of sheet abrasive a bit larger than the stopper and bend over two of the corners for the fingers to press on against the top of the stopper. It is comfortably easy for the fingers to grip and work with this. The small tit or finger grip on the stopper fits nicely in between the first and second fingers, making an excellent handle in a way to push paper and holder back and forth with. A much quicker, more easy, and less tiring piece of work can be accomplished in this manner. A handy one for those cleaning and painting jobs on the machine during its winter vacation.



—Frank W. Bentley, Jr.

Mandy: "Doctor, Ah's skeered Ah's got er infernal injury frum dat fall when Ah slipped on dat banana peelin'."

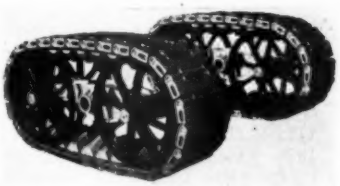
Doctor: "You mean 'internal' injury Mandy, 'Infernal' means lower regions."

Mandy: "Dat's right, doctor, 'infernal'."

EQUIPMENT YOU OUGHT TO KNOW ABOUT

The Roadlayer Track

THE Roadlayer Track manufactured by *La Plant-Choate Manufacturing Company, Cedar Rapids, Iowa,* embraces features which make it of especial interest to the dirt moving industry where heavy loads test the mettle of equipment. Several features combining to make the Roadlayer pull easily over the roughest ground are: the broad face of the track shoe giving a large supporting surface area; the large load wheels; the anti-clogging design allowing the tracks to clean themselves and prevents locking or binding; the design enabling the track belt to be both inward as well as outward trussing (the inward trussing prevents the belt from binding on the load wheels); and the machined and bushed hinge points which furnish a smooth, glass hard, wearing surface; and the true alignment of each shoe and pin preventing binding at those points. Every piece is heat-treated.



The Roadlayer Tracks are adapted for use on dump wagons, logging trailers, etc. For further information write the manufacturer, mentioning this magazine, please.

New Heavy Duty Hydraulic Hoist Unit

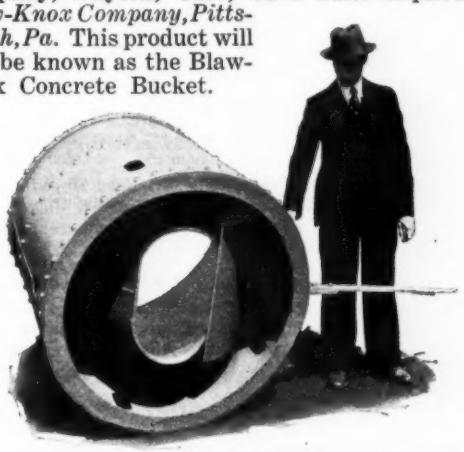
THE PRODUCTION of a heavy duty hydraulic hoist for all 1½-ton short-wheelbase chassis, with a complete line of steel bodies, was recently announced by *The Perfection Steel Body Company,* Galion, Ohio.

This hoist is presented by the manufacturer as a distinctly rugged, heavy duty job, designed and built for "over capacity" service. Besides its sturdy construction, the outstanding feature is the "cushion drop" mechanism or automatic control which gives it the advantage of dropping the body, either full or empty, very rapidly to the riding position, yet without "slamming" the frame. The "hydraulic cushion" becomes effective when the body frame comes to within several inches of the chassis, then it eases down to the full riding position.

The hoist raises the load to a full 50-degree angle in less than four seconds and returns it by controlled gravity to any intermediate position. Its safety feature is a distinct advantage—automatic valve mechanism holds the body in any raised position in case the power fails, engine stops, or even if power clutch is released accidentally. The loaded body will also "ride" in any raised position on this hydraulic cushion. The manufacturers claim a distinct saving of time in unloading operations and a saving in the cost of operation through lessened "wear and tear" on the mechanism. Further particulars will gladly be sent. Use one of the *Excavating Engineer* postcards when writing to this manufacturer.

Popular Bucket Changes Name

THE EXCLUSIVE manufacturing and sales rights of the Wiley Concrete Bucket, formerly manufactured and sold by The Dayton Whirley Company, Dayton, Ohio, have been acquired by *Blaw-Knox Company, Pittsburgh, Pa.* This product will now be known as the Blaw-Knox Concrete Bucket.



These buckets are for derrick or cableway operation, but can also be used as floor hoppers for loading buggies, wheelbarrows, or discharging into chutes. The buckets utilize a single radial gate for opening and closing. This gate is extremely easy to operate regardless of the amount of concrete in the bucket, giving absolute control of the discharge of the aggregate at all times. The bucket is extremely easy to spot just where concrete is required, is watertight and permits full delivery of batch of grout to forms without loss of aggregate. Buckets are made in the hook-on and two line types.

Blaw-Knox Concrete buckets are made in three standard sizes—18, 33 and 63 cubic foot capacity respectively. Larger buckets can be made to order, as required. Literature describing this bucket will be sent upon request. Please mention *Excavating Engineer* when writing.

She doesn't paint, she doesn't rouge;
She doesn't smoke, she doesn't booze;
She doesn't kiss, she doesn't pet:
She's fifty-eight and single yet.

SHOTS FROM THE FIRING LINE

N. Y. State Highway Chapter, A. G. C., to Meet in Utica March 9 and 10

THE ROAD AND STREET construction industry of New York State will gather at the Hotel Martin, Utica, March 9th and 10th, 1932, in connection with the Fifth Annual Convention of the New York State Highway Chapter, Associated General Contractors of America.

The gathering will attract hundreds of contractors from all sections of New York State. What is of interest to contractors is likewise of interest to material producers, equipment manufacturers, bonding interests, city and county officials, state and city engineers and all others allied with our industry. Meetings will be held on the morning, afternoon and evening of March 9th, and on the morning and afternoon of the 10th. A banquet will be held in the Grand Ball Room of the hotel, Thursday evening, March 10th.

The banquet will a be a friendly get-together with an elaborate entertainment furnished by associate members and advertisers in the Chapter's magazine. Those attending are assured of an all around good time at the banquet, and the business sessions will hold a wealth of information which will be most helpful to business activities and business relations.

The officers of the Chapter are: Richard Hopkins, Albany, President; George W. Chambers, Rochester, Vice-President; Samuel B. Easton, Albany, Secretary-Treasurer, and Harry R. Hayes, Albany, Engineering Secretary.

Voters Approve All-American Canal

THE Imperial Irrigation District, in Southern California, in its special election held February 11, approved the contract for the construction of the All-American Canal which is to distribute to that area water to be empounded by Hoover Dam. The returns received, as announced by the Department of the Interior, showed the proposal to have carried by a majority of five to one.

This is the final formality which clears the way for the execution of that phase of the Boulder Canyon Project which is secondary only to the erection of the dam itself.

The All-American Canal, so called because it will supersede the present canal which runs in part through Mexico, will cost $34,000,000, will float a ship drawing 20 feet of water, will cross an area of shifting sand-dunes, will be the most spectacular artificial waterway ever built. The land benefited obligates itself, under the terms of the contract approved yesterday, to return the complete cost to the Government.

Concrete Paving Up in 1931

LAST YEAR was a good year in road building, both in contracts awarded and projects completed, according to W. M. Kinney, general manager of the Portland Cement Association. "During 1931," said Mr. Kinney recently, "contracts let for concrete highways in the United Stated totaled 111,853,352 square yards, a gain of about 3.5 per cent over 1930, which was the best previous year." Mr. Kinney gave comparative figures for five preceding years as follows:

1930	108,008,062 sq. yds.
1929	92,816,794 sq. yds.
1928	93,531,487 sq. yds.
1927	77,232,917 sq. yds.
1926	64,978,458 sq. yds.

"Construction weather during 1931 was excellent, and a larger percentage of contracts were completed this year than usual," continued Mr. Kinney. "Although final figures are not yet available, reports from our field forces indicate that approximately 120,000,000 square yards of concrete highway pavements were actually laid during the year, including some 26,600,000 square yards of uncompleted contracts carried over from 1930." Based on an 18-foot width, pavement laid is equivalent to about 11,340 miles of road. In 1930 approximately 10,500 miles were completed.

Louisiana was the leading concrete road builder among the states during 1931, being followed closely by Texas, Illinois, and New York. More than 10,000,000 square yards of concrete road contracts were awarded in each of the first two states mentioned, and over 9,000,000 in the other two. Indiana, Iowa, Wisconsin, Michigan, and Minnesota

Annual Banquet of the National Crushed Stone Association Convention

each awarded contracts for more than 4,000,000 square yards of concrete highways.

Municipal paving work has declined considerably from the peak of 1928. Awards for concrete streets and alleys during 1931 totaled 22,635,471 square yards as compared to 37,813,593 for 1930 and 54,655,647 for 1928, the highest year on record. The fact that city paving is financed very largely by direct assessment against abutting property was a factor in the decline, as was the uncertain market for municipal securities.

Hoover Dam Notes

EXCAVATION on the 56-foot diameter diversion tunnels was 43 per cent completed on January 9th, according to the Reclamation Era for February. At that time the contractors had completed 8170 feet of the 41x56-foot section of the tunnels and an additional 7735 feet of the 12x12 pioneer bore. As this is written, report comes of suspension of work on the tunnels due to the rising waters of the flooding Colorado.

There were reported to be a total of 3121 men employed by the principal contractors, of which Six Companies, Incorporated, employ 2827. Of the total men employed 1050 were ex-service men and 3057 American citizens. The labor turnover is reported to be only 9 men daily, which has caused officials of the contracting companies to warn idle workers to stay away from Boulder City.

The U. S. Engineers Office at St. Louis recently announced the low bidders for levee work for the Hartwell Drainage and Levee District in Illinois. On item number 1, consisting of 666,000 yards, **Wells and Corneli**, of St. Louis, were low with a bid of 7.49c per yard. On item number 2, consisting of 435,000 yards, **Calkins Dredging Company, Inc.**, of Chicago, was low on a bid of 15.9c per yard. On the third item of 327,000 cubic yards, **Trinity Farms Construction Co.**, of Dallas, was low with a bid of 12.82c per yard.

National Sand and Gravel Association Holds Successful Convention

THE 16th annual convention of the National Sand and Gravel Association, which was held in Pittsburgh, January 27th to 29th, was, considering business conditions, one of the most successful ever held, with registration of nearly 500.

Among the interesting talks covering a wide range of subjects of particular interest to producers of sand and gravel were given at one session devoted to operating problems. At this session the following subjects were presented: Methods and Costs of Mining and Preparing Sand and Gravel at the plant of the Ward and Gravel Co., Oxford, Michigan, by Frederic L. Ward; Methods and Costs of Mining and Preparing Sand and Gravel at the Clowdy Plant of the Dallas Washed and Screened Gravel Company, Dallas, Texas, by Rollen J. Windrow; and Sand and Gravel Dredging Methods and Costs of J. K. Davison & Bros., Pittsburgh, Pa., by George W. Williamson. Another session was devoted largely to the subject of concrete and specifications for aggregates at which F. H. Jackson, U. S. Bureau of Public Roads, presented a paper on Designing Concrete Paving Mixtures by Water-Cement Ratio Trial Method.

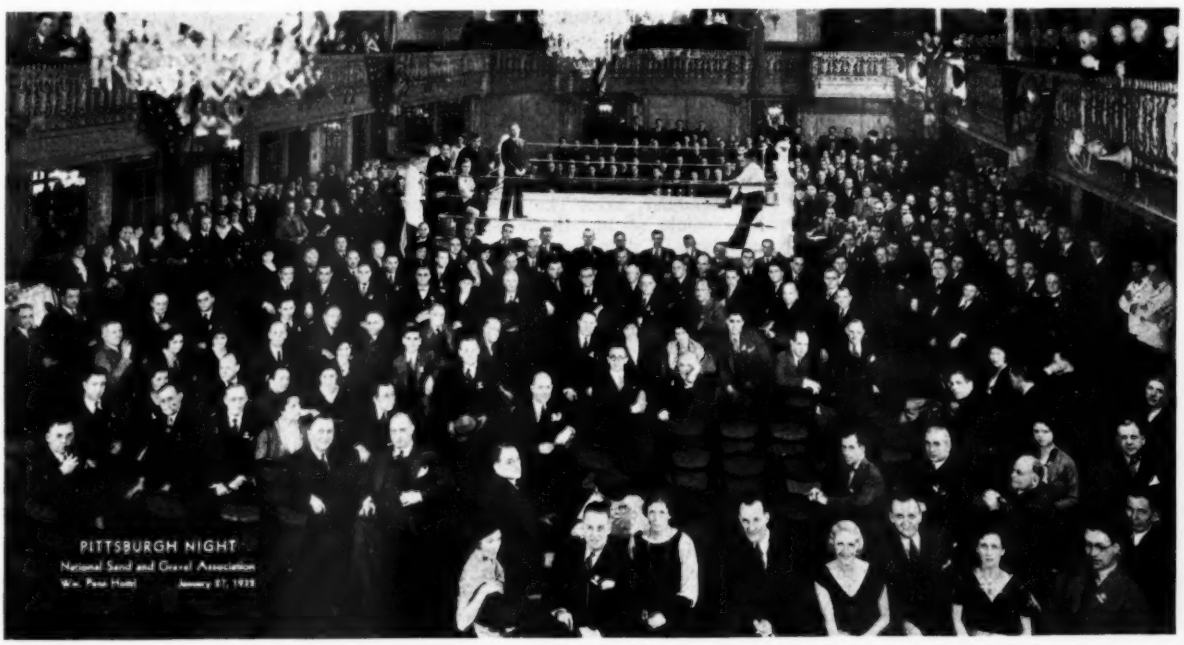
On the evening of the first day of the convention was held what was called "Pittsburgh Night"—amateur boxing followed by a buffet supper. The illustration at the bottom of this page shows the excellent turnout for this entertainment. The convention banquet was held on the evening of January 28th. Many manufacturers were represented with exhibits, including the following Excavating Engineer advertisers: Allis-Chalmers Mfg. Co., Milwaukee, Wis.; Blaw-Knox Co., Pittsburgh, Pa.; Bucyrus-Erie Company, South Milwaukee, Wis.; General Electric Company, Schenectady, N. Y.; A. Leschen & Sons Rope Company, St. Louis, Mo.; Nordberg Manufacturing Company, Milwaukee, Wis.; John A. Roebling's Sons Company, Trenton, N. J.; and Sauerman Bros., Inc., Chicago, Illinois.

Capacity of Water-Power Plants Increased 700,000 Horsepower in 1931

THE TOTAL CAPACITY of water wheels at water-power plants in the United States on January 1, 1932, according to the annual report just released by the Department of the Interior through the Geological Survey, was 15,562,805 horsepower, an increase during the year of 681,000 horsepower, or 4.3 per cent.

The capacity of water-power plants in the later part of 1921 was 7,927,000 horsepower. In the ten years since 1921 the capacity has practically doubled, and the increase has averaged about 760,000 horsepower a year. This average growth is noteworthy, because during this same period the development and improvement of steam power-plant equipment and the increase in the efficiency of operation of steam plants have been almost phenomenal.

and "Pittsburgh Night" of the National Sand and Gravel Association



Death takes William J. Black

TO all men must come eventually life's end, a final rest from work and leisure, closing the last chapter in their book of life, yet often bestowing to the future a memory which lives on. What is written in that book of life guides the future to progress and achievement. Such a book is now closed in the death of W. J. Black on January 15th, 1932, in whose loss we are at once poor in the end of a loyal and true friend, wealthy in the shining example of his service and achievement living always.

Born in Churchill, Ireland, on January 10, 1865, William J. Black was soon taken by his parents to Pennsylvania. At the age of six he moved to Chicago, where he spent his youth and where he obtained his first job with the Knickerbocker Ice Company, through Capt. Moshier of the Chicago Police Department, one of the many friends his spontaneous and open-hearted personality had immediately made for him and continued to make throughout his life. Ten years found him in a position, as Superintendent of Construction for the Kimball & Cobb Stone Company, to repay Capt. Moshier by giving him a job in charge of the night shift, constructing macadam walks and roads for the Chicago World's Fair in 1893. Another ten years passed, and we see him in charge of the vast railroad elevations with the Brownell Improvement Company, successors to Kimball and Cobb, in whose foundation he played a great part. First the Santa Fe, C. & A., I. C. elevation along Archer Avenue; then the Penn., C. J. R. R. elevations; then the Lake Shore & Michigan Southern (now New York Central) elevation from Englewood to 100th St.; then the Pennsylvania from 22nd St. to 100th St.; latter the Santa Fe, Michigan Central, C. & A. and Rock Island in Joliet, Illinois; then two miles of the Pennsylvania in Cleveland; later the New York Central in Elyria, Ohio; then two Iron Ore Docks in Ashtabula Harbor, Ohio.

By 1910 his company under his field supervision and the financial backing and management of Colonel Jefferson Hodgkins, had grown tremendously, their quarry at Thornton, Illinois, had become of first rank in size in the Middle West. Mr. Black was appointed General Manager in charge of field construction and of stone production

at Thornton. Through his vision and constructive thought the quarry expanded to a production of one million cubic yards of commercial crushed stone annually—the largest in the world—far in excess of normal capacities for its day. Gradually the company's business tended away from contracting to center on the production and sale of crushed stone from Thornton where since 1916 Mr. Black has confined his activities and thought. In his brother, John G. Black, he found an able and competent assistant with particular ability in designing and erecting a mill to handle a tremendous daily production which a quarry about a mile square and nine steam shovels gave him.

By 1917, "W. J.," as he was familiarly known, had acquired a reputation as one of the most reliable operators in the country. Though many concerns made offers for his services, his loyalty to the Company he had fostered, and with which he had himself grown, kept his life's interest at Thornton. An example of his dynamic ability to accomplish the seemingly impossible occurred that year. The old plant of wood caught fire and burned to the ground in December, 1916. The seasonal business would resume in the spring with no plant to supply its demand. Under his driving influence constant work throughout the winter resulted in a new and improved crusher building which was ready for shipments of stone by June 1st, 1917. His vision in foreseeing the necessity for another quarry of even greater daily capacity was responsible for the beginning of a long cut to the north reached by a tunnel beneath a public highway. This new quarry is now depended on for the bulk of production each day. He realized also the advantage of purchased electric power, effected in 1922. Through his instigation five shovels were changed over to traction wheels in 1927, resulting in lower production costs. To enumerate the benefits attendant on his experience and keen vision would serve only to bear out the great loss now felt by the Moulding-Brownell Corporation, a combination of stone quarries, sand and gravel pits and other enterprises of which the old Brownell Improvement Company is now a part, and for which Mr. Black was an able and keen manager of production to the end.

Of his personal life, several characteristics stand out, above all others—friendship. Wherever he went, with whomever he became associated, his good fellowship and reliability overcame all obstacles. The story is told that his most difficult daily problem was that of getting from place to place as so many friends would hail him on the way, with whom he never failed to stop and chat. His never-ending flow of humorous stories and his appreciation of a good one is exemplified in the keen sense of humor he possessed. He once told a superintendent under him who complained of the weight of a rail, that he would buy the next rails longer so that more men could get around one to lift it. Those under him respected his judgment and felt that at all times he would stand behind them. He knew them all by their first name, and in giving his orders so called them, orders which were never disobeyed. Always a familiar figure at the old Biggs House, he became a friend of all labor unions and never experienced trouble with them. In 1894 he became a Mason, attaining the degree of Knight Templar.

His family life was always his great enjoyment and pleasure. To his family as well as to his company his life was one of constant loyalty and service. In both cases his success was their success. He is survived by his wife, Mrs. Mary Black, his sister, Miss Anna Black, his brother, John G. Black, his son, W. E. Black, and a host of friends.

Pump 5,000,000-yards for New Orleans Airport

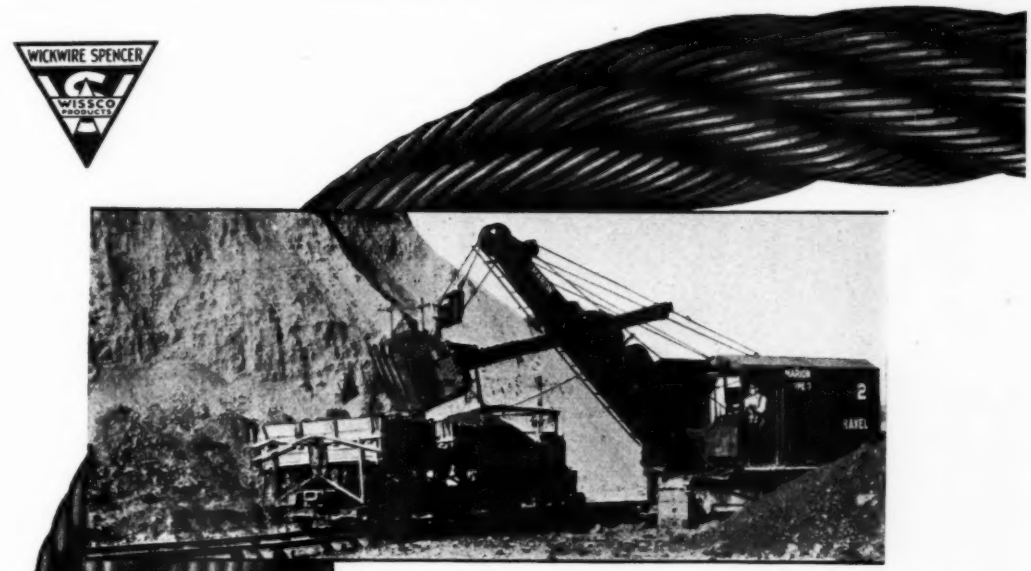
By PHIL THURSTON

WITH the massive wall bounding the new $2,000,000 Shushan airport at New Orleans nearly finished, the work of pumping a 5,000,000 cubic yard fill behind began about February 15th, according to John Klorer, chief engineer of the Orleans Levee Board.

Despite unfavorable weather during the past few weeks, the Fuller Construction Company, contractors for the wall, have finished all but a 200-foot stretch of the outer wall that will enclose hydraulic fill on which the airport will be constructed, Mr. Klorer said.

A last-minute change in plans to provide 11 more acres of automobile space on the land side of the airport will necessitate the building of 1000 more feet of concrete retaining wall but Mr. Klorer said that work on the fill would be unaffected.

Only tough Rope can stand this gaff



There is plenty of power in this huskie . . . and the fellow that works her is thinking of yardage, not rope. Only powerful rope can stand the abuse of monsters like this machine. Wickwire Spencer Shovel Rope is built to do this very job. The steel stock that goes into the wire gives extreme tensile strength and toughness. The care in manufacturing and discrimination in selling the right rope for the job all contribute to the long life of Wickwire Spencer Wire Rope even under severest conditions.

Wickwire Spencer Steel Company, 41 East 42nd Street, New York City; Buffalo, Chicago, Detroit, Philadelphia, Worcester; Tulsa, 314 East Archer Street; Pacific Coast Headquarters: San Francisco; Branches and Warehouses: Los Angeles, Portland, Seattle. Export Sales Department: New York City.

Send for our book. It is free and will prove of great value.

WIRE ROPE *by Wickwire Spencer*

For your convenience in writing to Wickwire Spencer Steel Company, you will find a card bound in this issue.

. . . . . *Slashing*
Excavating Costs!

The Williams Type "MF" Multiple-Rope Bucket not only *opens its mouth wider* but *bites in deeper* and *operates faster*.

Double Hinge allows a wider spread of the open bucket and permits a more rigid construction.

Six-Part Reeving gives straightest lead of closing cable, and longer roller guards in the head give complete protection against fraying of the cable—greatly reducing cable wear and replacement cost.

Put this unusual bucket to the test on your next job—and see for yourself. We guarantee absolute satisfaction in every detail. Write for full description.

WILLIAMS
FAST-DIGGING BUCKETS

. . .

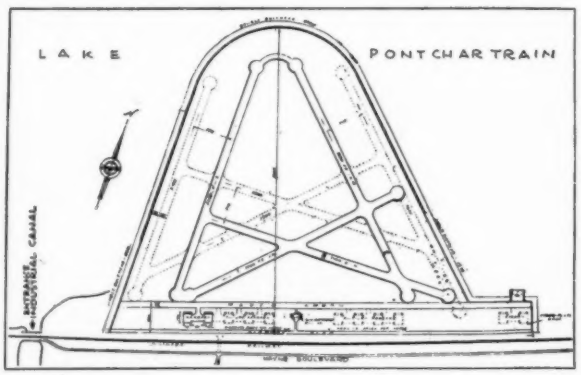
THE WELLMAN ENGINEERING CO.

7002 Central Avenue, Cleveland, Ohio

Birmingham - New York - Chicago - Pittsburgh - Detroit - Mexico

Shots From the Firing Line — *Continued*

The contract for the fill has been awarded to the Orleans Dredging Company for $695,000. The contract calls for completion within six months but plans are being considered by the levee board's engineers and officials of the



dredging company that would cut the time down to four or five months. This saving of time would be accomplished through the use of more dredges and the employment of additional men.

When completed, the airport will consist of a blunt-nosed, tri-angular wedge of land extending 3,950 feet straight out into Lake Pontchartrain from the present shore line. It will be a little over a mile wide at the shore end and will narrow down to a blunt end of about 1000 feet at its outer peak.

Foreign

Chosen

Chosen (Korea) has plans for the construction of 433 miles of new roads of earth and gravel to cost about $4,200,000. The 1932 part of this extensive program provides for 31 miles of highway construction at a cost of $280,000.

Colombia

The government of Colombia proposes to expend 4,650,000 pesos on important highways in the next 3 years. The program calls for an expenditure of 1,620,000 pesos in 1932, 1,506,000 pesos in 1933 and 1,520,000 pesos in 1934. The Colombian peso is quoted on latest rate of exchange at about 96½c United States currency.

The proposed highways would connect Bogota with Cucuta, Popayan and Pasto, Pasto with El Diviso, Neiva with Garzon, and the interior of the Department of Boyaca with the Magdalena River, and make it possible to travel by motor vehicle between the boundaries of Colombia and Ecuador in the south and Colombia and Venezuela in the northeast. These highways will open up new and important sections of Colombia.

Mexico

The Mexican government has recently awarded to the Cia. Constructors Acapulco a contract to complete the southern part of the Laredo-Mexico City Highway. This project, about 145 miles in length, will cost approximately $2,400,000. The work is to be completed within 18 months from January 1st, 1932.

An old codger was crossing at a busy corner when a huge police dog dashed into him and bowled him over. The next instant an Austin skidded around a corner, bumped him, inflicting more severe bruises.

Bystanders assisted him to his feet, and someone asked him if the dog had hurt him.

"Not exactly," he replied, "it was the tin can tied to his tail that did the most damage."

Operator: "W'at's worryin' you today, Jack?"

Pitman Jack: "I found a recipe for 'ome-made beer, an' I got no 'ome."

For your convenience in writing to The Wellman Engineering Co., you will find a card bound in this issue.

A *Plain* STATEMENT about Roebling Rope economy

Recently much has been published regarding the service and economy of wire ropes.

For the guidance of rope buyers, therefore, Roebling desires to make the following statement, concerning the operating cost of its ropes, backed up by their performance in actual service over a period of many years:—

"Roebling does assert that when gauged by the work performed, NO wire rope, regardless of make or construction, will show lower general average operating costs than Roebling."

If you are not a user of Roebling Rope we invite you to try it—to see first hand evidence of its great stamina. We do not ask you to accept the service record of a single rope as conclusive proof of the general performance of Roebling Rope. Put Roebling Rope to the only reliable and most exacting rope service test:—judge it on the basis of its *average* cost per ton of material handled, per miles of travel, or other unit of service measurement.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

Wire · Wire Rope · Copper & Insulated Wires & Cables · Welding Wire · Flat Wire · Wire Cloth & Wire Netting

Branches in Principal Cities Export Dept.—New York, N.Y.

Wire Rope for all purposes

There is no such thing as a wire rope "cure-all". No one design of wire rope is suitable for all purposes. ¶Roebling makes wire rope of a great variety of types and constructions, and therefore can supply a wire rope exactly suited to each particular requirement. ¶The great stamina of all Roebling Ropes is primarily due to the quality of Roebling Wire. This Acid Steel Wire is renowned for its fatigue and wearing qualities. No better rope wire is produced. ¶"BLUE CENTER" STEEL is the highest grade and is generally recommended for severe duty.

JOHN A. ROEBLING'S SONS COMPANY

For your convenience in writing to John A. Roebling's Sons Company, you will find a card bound in this issue.

AMERICAN
STEEL & WIRE COMPANY
WIRE ROPE

ON shovels—on derricks—brute force is necessary to loosen and load rock—mighty strength is essential to raise it out of the hole. Truly—here are daily tasks to test wire rope performance to the utmost. To keep equipment on the job—to eliminate costly replacements and assure lower operating costs—most users specify American Steel & Wire Company American Wire Rope. Experience has proved its superiority—the service back of it is a valuable asset.

1831 MORE THAN 100 YEARS of PROGRESS IN WIRE MAKING 1932

AMERICAN STEEL & WIRE COMPANY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

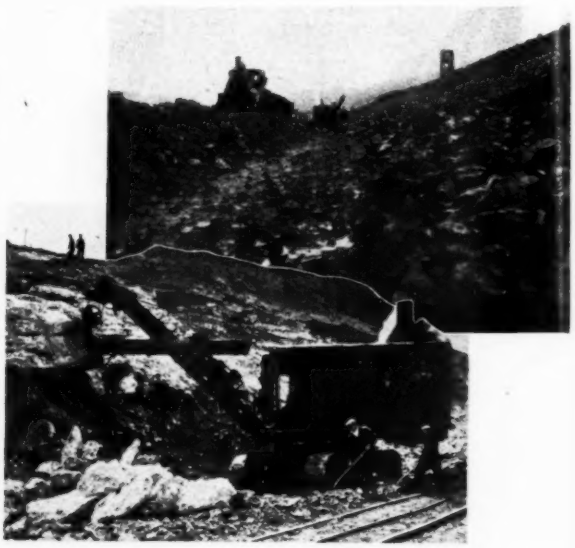
208 South La Salle Street, Chicago And All Principal Cities

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

Shots From the Firing Line — *Continued*

France



The accompanying illustrations show excavating operations of the important French contractors, **Enterprise E. Roussel of Nancy** and come to us through the courtesy of Brunner & Marchand of Paris. The machines are two Bucyrus-Erie 30-B streamers, one of which has been in operation since 1925, the other since 1927. Both have been used on important excavations including the Col de Saales and the Lerouville-Metz line, these two alone totaling 1,400,000 cubic meters (1,831,200 cubic yards).

"They have performed perfectly in all kinds of ground; granite, the porphory of the Col de Saales, the hard limestone of Jaulny, the plastic clay of the Woevre," Monsieur Roussel tells us.

"Their great mobility permits them to carry out small contracts during their displacement from one important job to another.

"By keeping in stock a small number of spares which are likely to break under some violent strain, one can keep the machine working regularly throughout an entire contract; after which, one or two weeks of shutdown are sufficient for carrying out all repairs.

"The output depends on the nature of the ground, on the up-keep of the wagon-ways, on the rapidity of handling the trains, on the ability of the operator, on the rapid supply of materials consumed, on the capacity of the wagons, etc. . . . etc. . . . In my opinion its evaluation in cubic metres does not qualify a shovel. I reckon it in comparison with another shovel. My two 30-B shovels (1-cubic metre bucket) have produced annually as much as my other shovels (15 and 20-tons bail pull, 2-cubic metre buckets)."

The work shown is the grading of a railway line and the machines are serviced by wagons of 1 meter gauge (39.37 inches) and capacity of 4 cubic meters (5.232 yards).

These jail birds are tough nowadays. One who was about to be executed was told that he could have an hour of grace.

"OK, boss, bring her in," was the nonchalant reply.

In the smoking room of the big hotel the Scot had been boring everyone with tales of the great deeds he had done.

"Well, now," said an Englishman at last, "suppose you tell us something you can't do, and, by jove, I'll undertake to do it myself."

"Thank ye," replied the Scot. "I canna pay ma bill here."

For your convenience in writing to American Steel & Wire Company, you will find a card bound in this issue.

NOW—ESTABLISH **NEW** AND **LOWER** DIRT MOVING AND GRADING COSTS

Blaw-Knox (Ateco) HYDRAULIC SCRAPER
cutting dirt moving costs on difficult work.

WAGON GRADER

BULLDOZER

TAMPING ROLLER

SCARIFIER

Put your dirt moving costs down where they belong---as low as 5 cents per cubic yard in many instances.

Blaw-Knox Equipment does it.

This impressive line-up of dirt moving machinery is breaking cost records everywhere.

Low in first cost---low in maintenance. Highly efficient--- Blaw-Knox Dirt Moving Equipment often pays for itself on the first job.

Let a Blaw-Knox dirt moving expert show you how costs can be lowered on your present contract. Give full details---a sketch will be helpful.

If you don't have a job at the present time, keep this page as a memorandum to write Blaw-Knox when you get one.

Get Blaw-Knox Catalog No. 1310.

Fill in and mail this coupon

BLAW-KNOX COMPANY, 2018 Farmers Bank Building, Pittsburgh, Pa.

Send me complete information about the Blaw-Knox (Ateco) Hydraulic Scraper and the complete line of Blaw-Knox (Ateco) Dirt Moving Equipment.

Name_____

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BLAW-KNOX

"HERCULES"
RED-STRAND
REG. U.S. PAT. OFF.
WIRE ROPE

YOU men who operate excavators and shovels know that dependable wire rope is necessary if safe and economical results are to be had. . . You can depend on "HERCULES" because it is properly balanced in strength, toughness, wearing ability and all other qualities that hard work requires. Moreover, it is furnished in both Round Strand and Patent Flattened Strand constructions in order to "fit" all types of machines. Why not give it a chance to show you what it can do?

The Wire Rope with the Service Record

Made Only By

A. Leschen & Sons Rope Co.
5909 Kennerly Avenue
ST. LOUIS, MO.

New York.....87 to 90 West Street
Chicago.....810 W. Washington Blvd.
Denver.....1554 Wazee Street
San Francisco.....520 Fourth Street

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

New York Notes

By J. W. FAWCETT

N. A. Steele subbed on the Arthur A. Johnson contract on the Queensborough Subway. The above view shows his Bucyrus-Erie 37-B loading to Michael J. Torpey's trucks. Mr. Steele is spotting them two-up and averaged better than 1000 yards a day on the project. This 37-B, one of Bucyrus-Erie's newer models, is equipped with 23-foot boom, 17-foot stick and 1¼-yard dipper.

Delaware Notes

R. E. Dutcher, of Middletown, was low with bid of $40,222.00 on the Bear-State road grading contract. This job is 2.53 miles long and involves 33,000 cubic yards of excavation and 13,000 cubic yards of borrow.

Irving B. A. Huie & Company, of Saugerties, New York, submitted low bid of $49,239.00 on the Willow Grove-Woodside 3.519-mile job which involves 15,500 cubic yards of excavation and 3,580 cubic yards of concrete pavement.

Joseph Ciccone, of Philadelphia, was low bidder on 42,200 cubic yards of excavation on the East Loockerman St. Dover Extension.

D. E. O'Connell & Sons, of Ridleypark, Pennsylvania, was low bidder on a grading and paving job on 7th Street in New Castle.

A. Petrillo and Company of Wilmington, with a bid of $16,710.00, were awarded the contract for grading 1.01 miles between Augustine Bridge and Concord Pike. The total amount of excavation was 24,000 cubic yards.

Continental Contracting Company of Baltimore, Maryland was awarded the contract of 3.74 miles between Gum Cross Roads and Middleford. This contract consisted of excavating 22,000 cubic yards of material. The amount of the bid was $59,595.00.

The Old Line Construction Company of Chestertown, Maryland with a bid of $21,949.00 was awarded the contract for excavating 21,000 cubic yards of material on the 2.72 miles between Stockley and Zoar Camp.

Buffalo Notes

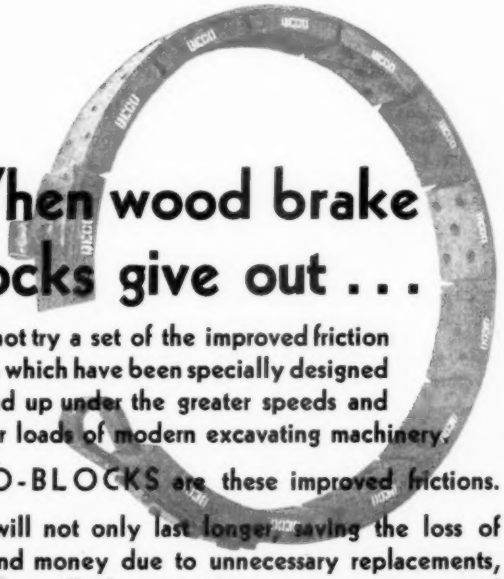
By D. E. WHITE

Robert Holmes, County Superintendent of Wyoming County, who has been ill, is convalescing in the Buffalo General Hospital. It is our hope that Mr. Holmes will soon be back on the job.

A. Calurusso & Son, Hudson, have their Bucyrus-Erie GA-2 at present working on a foundation job for the Universal Atlas Portland Cement Company, Hudson, N. Y.

Our friend Major Huie, Saugerties, has all of his road-building equipment in great shape and is in hopes of landing a piece of work in the near future, whereby he can go out and "cut the buck."

W. A. Shafer Construction Company, 35 Market Street, Poughkeepsie, have been going over their Bucyrus-Erie



When wood brake blocks give out . . .

Why not try a set of the improved friction blocks which have been specially designed to stand up under the greater speeds and heavier loads of modern excavating machinery.

BECO-BLOCKS are these improved frictions.

They will not only last longer, saving the loss of time and money due to unnecessary replacements, but they will also provide more accurate control . . . smooth, sure starting . . . will not grab . . . quick to let go . . . no after-catches.

WRITE US FOR FULL INFORMATION.

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

Specialty Department South Milwaukee, Wisconsin

MAN WANTED The user of a Hayward Bucket needs only one man to sit in the cab of the crane and operate the bucket. Address The Hayward Company, 52-54 Church St., New York, N. Y.
Hayward Buckets

Shots From the Firing Line — *Continued*

Type "A" and Type "B" machines this winter and have both machines up in great shape. Our old friend, Roy Miller, who has been operating the above machines for the past several years, is all set to hit the ball.

Our friend **Reece Bowling** has all the trucks in great shape and can't wait to start work. Mr. Shafer is one of the large number of contractors in the State of New York who is very optimistic and believes that good times are just around the corner.

Pittsburgh and Vicinity

By J. S. WEAVER

The contract for the paving of East Greene Street from Montgomery Avenue eastward to the thoroughfare's junction with Route 19 at the Monongahela railroad bridge just west of Morrisville, has been awarded to the **Tri-State Engineering Company**, of Waynesburg, and Cumberland, Maryland, at a joint meeting of the Waynesburg Borough Council and the Franklin Township Supervisors.

An $8,000,000 contract for the construction of 200 miles of railroad in Central America has been awarded to the **H. B. Watters Company**, of Columbus, Ohio, officials announced recently. The new road will require eight years for completion, replacing the present Honduras National Railway, a 70-mile stretch.

ROBERT TRIMBLE

Funeral services for Robert Trimble, retired Assistant Chief Engineer of the Pennsylvania Railroad System, who died in his home, McKown Street, Glen Osborn, Pennsylvania, Saturday, February 6th, was held on Monday afternoon, February 8th, from the First United Presbyterian Church, Sewickley, Pennsylvania. He was a brother of Judge Thomas P. Trimble of orphans' court.

Building a 40 Foot Fill

Raising this 40 foot fill on a railroad construction job, without the use of jacks—or the building of a trestle, is just one of the many instances where the Track Machine has been used at a great saving in time and labor. Disposing of overburden at quarries and mines, or any similar job where a track gang is maintained for shifting and raising, this machine and a few men will do the job quickly and soon pay for itself out of expense ordinarily required for men working with bars and jacks.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK SHIFTER

Albert DePaul is operating a Type "B" Bucyrus-Erie shovel for R. D. Thomas Company.

The Dravo Contracting Company, of Pittsburgh, was awarded the contract to build the abutment and dam for Lock No. 4, Monongahela river at Rostraver, according to word received by J. W. Arras, principal United States engineer, from the chief of engineers, Washington.

Walter Frazier, that well-known contractor of Bloomingdale, Ohio, was a visitor to our office some few days ago. He was looking fine and we hope he will return again soon.

The new Board of County Commissioners of Allegheny County, which took office the first Monday in January, have about completed their cabinet. The new commissioners are Charles C. McGovern, Chairman, C. M. Barr and William D. Mansfield.

George S. Fahning, Chief Engineer, Erie Railroad, with headquarters in Cleveland, Ohio, has awarded the Elmira, New York, work to the **Newhall Construction Company**, of Cleveland, Ohio. This work will run well over a half million dollars.

Detroit and Vicinity

By G. HENRY

The Persinger Excavating Company, of Lincoln Park, was awarded 1.468 miles of 21-foot two-course gravel on a low bid of $14,884.66.

Alpine Excavating and Trucking Company, Detroit, was low bidder on 3.5 miles of grading and drainage structures on US-24, Oakland County, their bid being $31,184.00.

H. Campbell & Son, of Port Huron, were awarded contract for 4.334 miles grading and drainage structures on US-25 at $24,188.

The John R. Edelman Company, Muskegon, was low bidder on approximately 300,000 yards of grading and drainage structures in Kalamazoo County.

Walter Knapp, of Monroe, was low bidder on a project in Monroe County for improving 8.385 miles of road. The work consists of widening the grade and lengthening the drainage structures and involves about 50,000 yards of earth excavation.

Indiana Notes

The O'Donnell Sand & Gravel Company of Vincennes, Indiana is reported low bidder on the contract for grading 25,000 cubic yards of the George Rogers Clark memorial grounds at Vincennes. The low bid was 38 cents a yard.

The Hamer-Paskins Construction Company of Chicago is reported to have received a contract from the Grand Trunk Western railway at South Bend, Indiana for its part of the grade separation work in South Bend on a bid of $500,000.

The City Council of South Bend unanimously passed the subway bond ordinance by which three subways to cost $1,200,000 will be built on the west side.

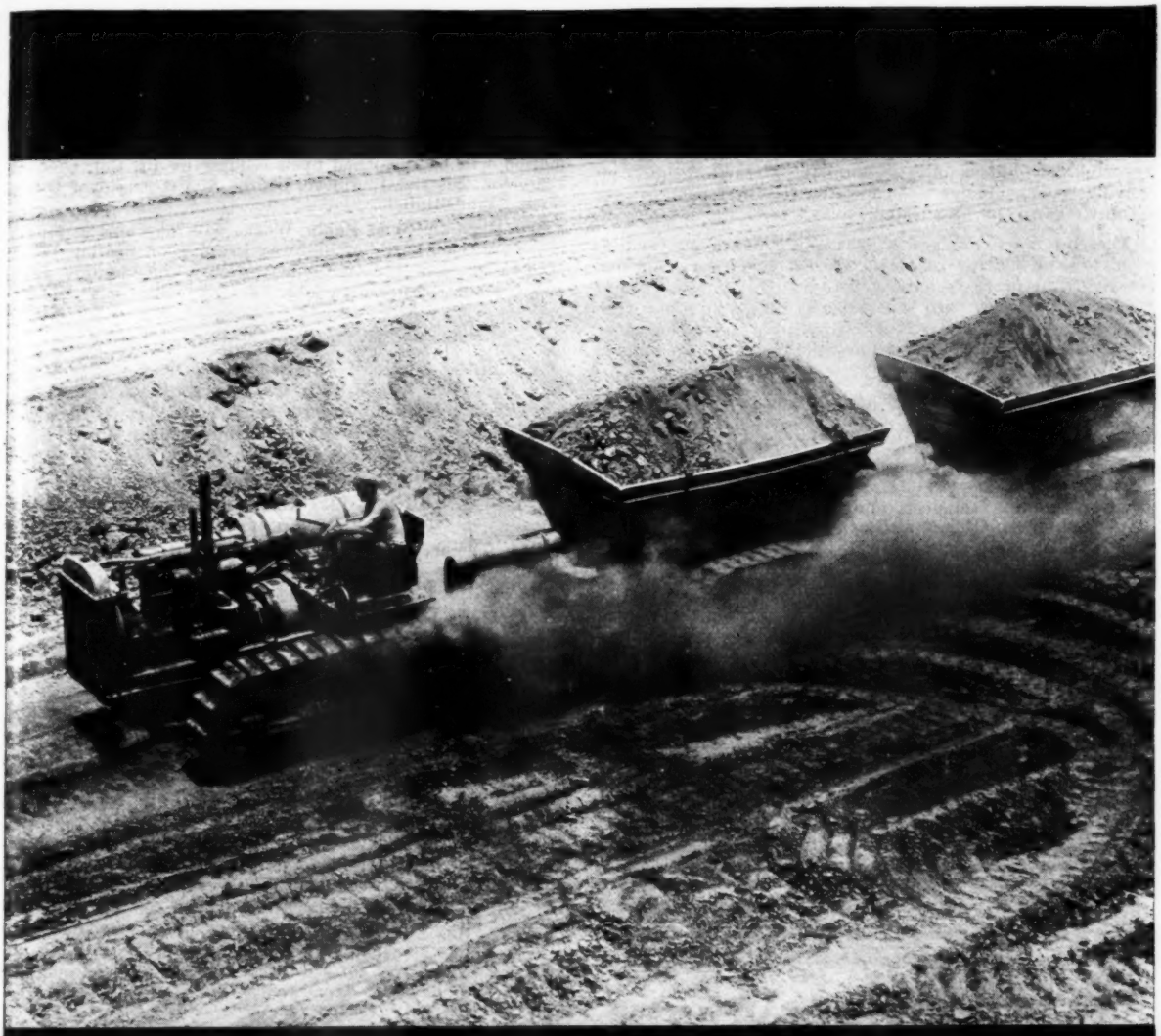
The Board of Public Works of Indianapolis has passed a resolution asking the City Council to issue $100,000 in bonds to pay the city's share of track elevation projects in Belt railroad from West New York Street to English Avenue and from East Michigan to East 13th Streets.

Illinois Notes

The Henry County Board of Supervisors has adopted resolutions making available gas tax fund appropriations of $100,000 for State Aid Route No. 15, Section 12, 27,840 feet in length and to be improved with 10-foot concrete pavement; $82,000 for State Aid Route No. 9, Section 13, 23,900 feet long and to be paved with concrete.

Lake County Superintendent of Highways **R. M. Lobdell**, reports plans for paving three stretches of highway this year as follows: The Bulkley road, north of Libertyville, which is to be paved from Five Points on Waukegan road to connect with Routes 21 and 172 for which nearly all the right-of-way has been secured. This stretch is five miles long and will be paved with 18-foot concrete. The second project is the Half Day-Diamond Lake road which consists of 4½ miles of 20-foot concrete pavement. The third project is a five-mile stretch of road from Wedge's Corners on Grand Avenue south to connect with Route 21. This road will be paved with 18-foot concrete.

For your convenience in writing to Nordberg Mfg. Co., you will find a card bound in this issue.



"Caterpillars" stand out because they stand up

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.
Track-type Tractors Road Machinery
Combines
(There's a "Caterpillar" Dealer Near You)

Prices—f. o. b. Peoria, Illinois

TEN	$1100	THIRTY	$2375
FIFTEEN	$1450	FIFTY	$3675
TWENTY	$1900	SIXTY	$4175

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

THE first choice of the contractor is the "Caterpillar." He knows the superior stamina that is revealed by two, three, four years of the hardest work. He knows how slowly heat-treated steels yield to dust and mud. He recognizes the higher "turn-in value" of "Caterpillars." He appreciates the uninterrupted service built-in to meet the hardest conditions of ground and weather. The longer the investigation of the tractor market the surer the choice of "Caterpillar" track-type Tractors.

For your convenience in writing to Caterpillar Tractor Co., you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

The War Department has announced an appropriation of $100,000 for construction of a new dam in the Illinois deep waterway at Marseilles. Bids were expected to be called on this project during February.

The Mathews Construction Company of Erie, Illinois is reported low bidder on the building of earth grades involving 38,000 cubic yards of grading for three bridges over Eliza Creek in the Bay Island Levee and Drainage District.

The New York, Chicago & St. Louis plans to ask for bids soon for the placing of about 215,000 cubic yards of material for the proposed extension to its 103rd Street yard at Chicago. The new yard will replace this road's old yard north of Ninety-fifth street near Stony Island Avenue, which is to be abandoned to allow the opening of a number of city streets.

W. F. Mannagh, of Serena, was awarded 5.9 miles of grading and culverts on section 1A of 15D on bid of $24,020.

The Al Johnson Construction Company, of St. Paul, Minnesota, was low on bidding for construction of a channel 200 feet wide, 9 feet deep, and 2½ miles long at Starved Rock pool on the Illinois waterway. Their bid was $270,400.

R. F. Fisher, Champaign County Superintendent of Highways, reports that plans for the 1932 county highway program are progressing to such an extent that bids will be taken between March 15 and April 15 for construction of twenty-four miles of 9-foot concrete slab. The work of preparing the roads for pavement has already started under contracts awarded last fall.

Excavation of a new cutoff channel and the deepening and enlarging of the existing channel of south slough west of the village of Milan, Illinois, will be bid March 15th. The distance is approximately 2.8 miles, the purpose, providing additional protection from the over-flow of Mill Creek and South Slough in the vicinity of Milan. The work will consist of excavation of a new cutoff channel for 1.5 miles and the deepening and enlarging of the existing channel for 1.3 miles and involves the removal of approximately 208,738 cubic yards of material. The work is to be performed within 120 calendar days after notice to proceed. The Eight Hour Law governing the hours of labor on construction of public works is to apply to the work. Further information will be furnished upon request by Lt. Col. Glen E. Edgerton, District Engineer, United States Engineer Office, Rock Island, Illinois.

The Department of Public Works will take bids to March 9th on 263,500 yards of highway grading on Section 123-A of 5.56 miles in Fulton County. Also a considerable number of paving and bridge jobs.

Wisconsin Notes

A contract has been awarded by the Chicago & North Western to the **Jutton-Kelly Company,** Milwaukee, for the construction of a subway to carry State Trunk Highway No. 119 under the tracks of this company near Butler, Wisconsin at a cost of about $25,000.

St. Louis and Vicinity

By A. J. KOENIG

J. J. Gilmore of Chicago, with a bid of $68,343 was low among twelve bidders for the construction of the foundations for the new west approach to the Municipal Bridge, in St. Louis. The Engineer's estimate was $127,000.

Plans for a $75,000 sewer to be built beneath DeBaliviere Avenue from Pershing Avenue to River Des Peres sewer have been completed by W. W. Horner chief engineer of the City of St. Louis. Bids have been asked for and work will start soon after the first of March.

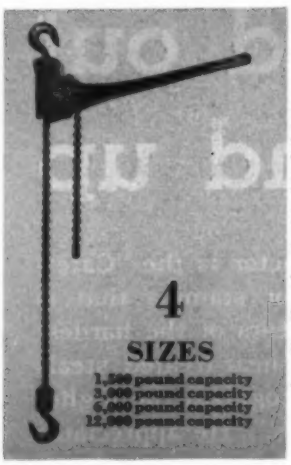
The St. Louis County Court advertised for bids on eleven road and bridge projects. Two of the projects are on route 77, Lindbergh Drive, the first is for 21,241 feet of 20-foot concrete from Halls Ferry Road to Highway 99; the other for 22,466 feet of 20-foot concrete slab, from Halls Ferry Road to Robertson Road. Other projects as follows: Brown Road, 54,030 feet. McKnight Road, 4,825 feet. Wellston Road, 1,150 feet. Wellsmar Avenue, 1,408 feet. All the above to be 20-foot concrete. 4,282 feet on Gore Avenue, two 10-foot strips on either side of car tracks. Lasky Road, to be graded to 36 feet for a distance of 3140 feet. A concrete bridge with a 20-foot roadway will be built over Sutter creek.

Martin Wunderlich, Jefferson City, has contract for four gravel and grading projects in Jackson county, Illinois.

The Treasury Department, Washington, D. C., will soon take bids for excavating and foundations for the Federal Building at 12th and Market Sts. in St. Louis.

G. E. Hoffman Construction Company was low bidder for the grading of two Illinois Central subways in DeWitt and Logan counties, Illinois.

As easy as jacking up your CAR!



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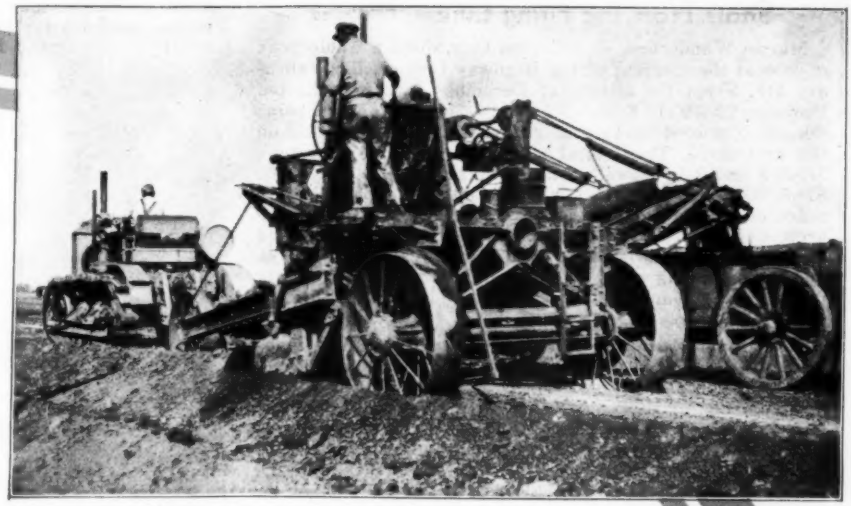

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Gruelling service of several seasons has never yet developed a weakness in the frame of the Western No. 6 elevating grader. Great strength without excessive weight has been accomplished by its revolutionary design. The members are relatively light but metal is massed where needed. A 10-inch torsion tube of steel gives the machine an UNBENDABLE backbone.

The No. 6 is absolutely new throughout.

Rugged construction; a stiff leg that forces the plow into the ground; a one-piece rigid elevator; 3-point suspension; a motor-driven belt and automatic belt tension control, combine to give enormous and trouble-free production.

Bulletin W-31-CK describes in detail the construction features that enable the Western No. 6 to produce a big yardage at low cost. Where shall we send your copy?

WESTERN WHEELED SCRAPER COMPANY

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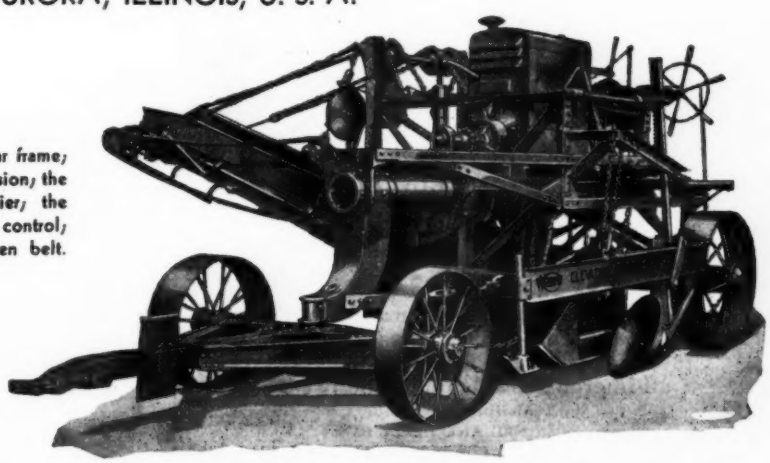
AURORA, ILLINOIS, U. S. A.



• Note the tubular frame; 3-point suspension; the one-piece carrier; the stiff leg plow control; the motor driven belt.

WESTERN

For your convenience in writing to Western Wheeled Scraper Company, you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

Martin Wunderlich, of Jefferson City, drew a whole flock of jobs at the meeting of the Highway Commission, February 9th. From the letting of December 18th he collected Projects 72-AP 1, 2, 3, 4, 5, and 6 in Dent and Phelps Counties, graded earth and gravel with crushed rock on the first three. These total about 26 miles. He also took SC-1, 2 and 3 in Howell County for 11.34 miles and SA-2, SD-5, SE-3 and SE-4 in Oregon County, totaling about 12 miles of graded earth. From the February 2nd letting he drew 46-2 in Worth County, 2 miles of graded earth and gravel, SA-1 in Lewis County, 2.273 miles earth and gravel, and three grading and graveling projects in Marion County totaling over 5 miles—SD-3A, SN-2, and SN-3.

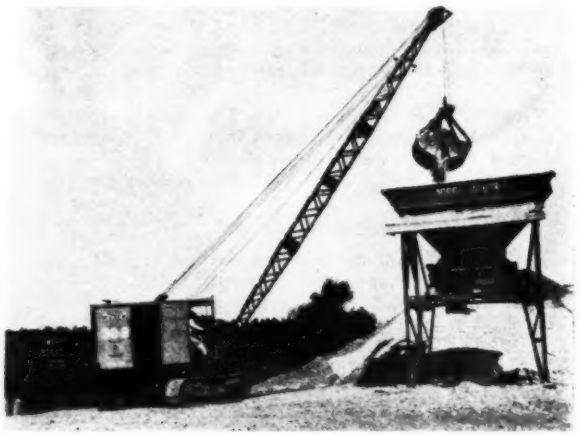
Among other successful bidders on grading projects were **McMahan and Waller Construction Co.,** of Rich Hill, 5 miles in Daviess County; **C. I. Williams,** of Monett, 6 miles in Christian and also 4.6 miles in Greene; **B. F. Brooks Construction Co.,** of Dallas, Texas, 2.3 miles in Miller; **Garrett Construction Co.,** of Springfield, 3 miles in Polk; **Kelly & Underwood,** of Granby, 6.8 miles in Stone and also 10.7 miles in Newton; **R. G. Aldridge,** of Kansas City, Kansas, 3.3 miles in Worth; **Service Construction Co.,** of Poplar Bluff, 1.2 miles in Wright; **L. L. Sharp,** of Greenfield, 4.4 miles in Dade; **Amyx & Mitchell,** of Bakersfield, 2.3 miles in Hickory; **H. D. Thomas,** of Fulton, 1.8 miles in Hickory; **J. M. Roark,** of Anderson, 3 miles in Jasper; **C. W. Rose,** of Brookfield, 8 miles in Sullivan; **Independent Construction Co.,** of Pittsburg, Kansas, 8.4 miles in Vernon; **John Spitcaufsky,** of Kansas City, 2 miles in Andrew; **A. W. Mosley,** of Kansas City, 10.2 miles in Nodaway.

Louis Rich Construction Company, East St. Louis, was low on the grading of 19.63 miles on Highway No. 185, Fayette county, Illinois.

S. J. Groves & Sons Company have contract on route 67, for 8.72 miles paving in McHenry county, Illinois.

Central Engineering Company, Davenport, Iowa, was awarded contract for paving 17 miles on route No. 80 in Carroll, Whiteside and Rock Island counties.

By C. F. BARTON



The C. H. Atkinson Paving Company use their Bucyrus-Erie 32-B clamsell rig as a crane in unloading the material and equipment for their 10 mile paving job near Diamond, Missouri. The machine works with a 50 foot boom and uses a 1⅛ yard Owen bucket handling aggregated. In the above picture, however, it is unloading a roller.

The Board of Trustees of the East Side Levee and Sanitary District, East St. Louis, Illinois will receive bids on March 10th for the completion of the West Levee of Construction Project number 12 from Millstadt road to a point 7000 feet southward. It is estimated that this work will require 137,000 cubic yards of earth fill.

Lieutenant-Colonel Glen E. Edgerton, chief of the Rock Island district, U.S. Engineers, has announced that the specifications for straightening Mill Creek channel from Jimmy creek near Milan west to the Mississippi River have been recently completed. Colonel George R. Spalding, U.S. district engineer at St. Louis must approve these specifications before work can be started. The specifications call for moving about 210,000 cubic yards by dredging at an estimated cost of $20,000.

The United States Engineer's Office at St. Louis, Missouri received bids Feb. 17th for placing about 1,428,000 cubic yards of earth work in rebuilding and enlarging the levee of the Hartwell Drainage and Levee District, Greene County, Illinois on the Illinois River. The proposed improvement starts just south of Hillview, Illinois. The upper end of the river front levee is across the Illinois River from, and approximately opposite, Pearl, Illinois. The lower end is approximately 6 miles north along the bluff road from Eldred, Illinois. The material to be excavated will be taken

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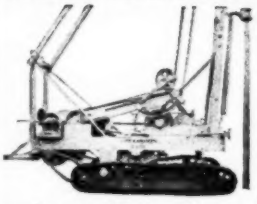

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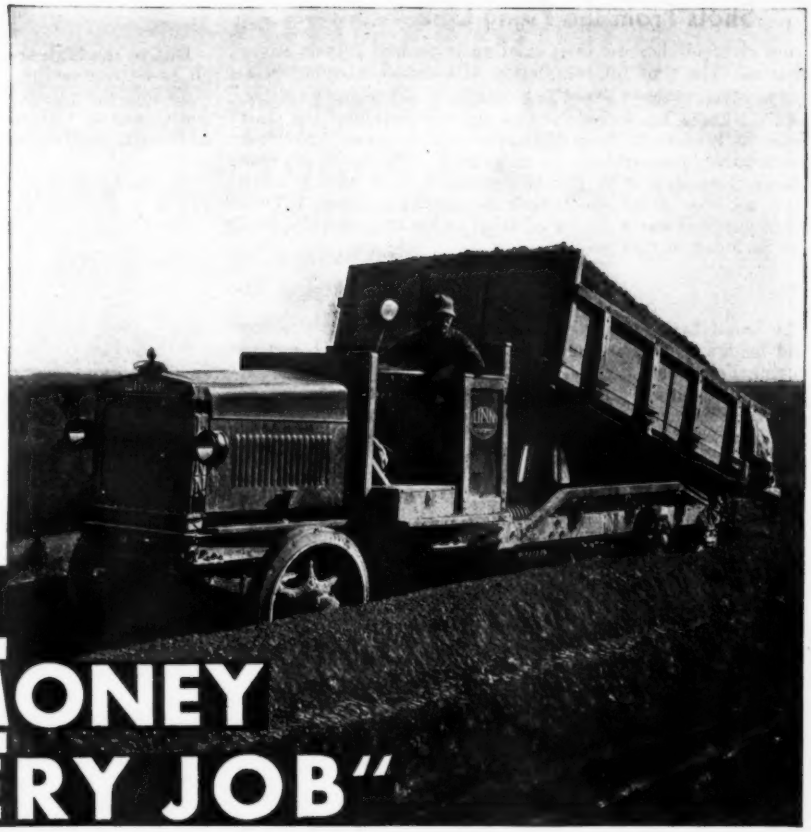

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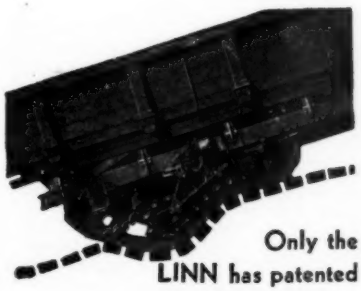
Other Patents Pending



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Shots From the Firing Line — *Continued*

from riverside borrow pits, existing levee and Illinois River channel. The time for completion will be 255 calendar days.

The East Side Levee and Sanitary District, East St. Louis, Illinois, has asked for bids for completion of the west levee of Project 12 from Millstadt road to point 7,000 feet southward. Estimated cost is $90,000. The bids are due March 10th and it is planned to have construction work start as soon after the letting as possible. About 137,000 cubic yards of earth fill, in addition to hauling and clearing, are included in this project.

Southern Notes

By R. S. WELFER

A small bridge letting in Georgia, and several grading and bridge in Tennessee, added some work in this section during February.

South Carolina, through legislative action, is trying to care for contractors whose work was interrupted by the poor bond market.

M. R. Woodall, Atlanta, is making good progress on his project near Canton, adjoining one just completed. He is using a Northwest shovel and a Type B Erie. The latter is approximately ten years old but is in very good condition and making a very fine showing in a deep cut where the percentage of rock is high.

Lambert & Collier, Atlanta, have their Koehring machine near Grady, Georgia. E. P. Brock, operator, has given the machine excellent care. The interior of the cab is as clean as a large power plant. Brock wants no praise, stating a clean machine makes his job an easy one.

C. R. Hopper, Griffin, Georgia, has a clamshell machine on the same job which also shows the best of care.

Dicus Brothers, Waynesville, North Carolina, report good progress on a dam job in that section.

Southern Paving Construction Company, Chattanooga, has started to improve one of the approaches to Missionary Ridge.

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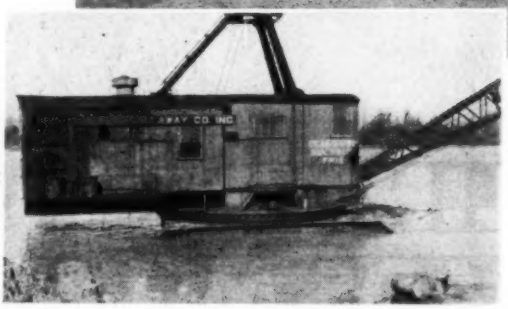
River Notes

By W. W. WHORLEY

Due to the high stage of the Mississippi River practically all levee contractors have been compelled to cease operations and the prospects are it will be several months before work can be undertaken again, depending on how much additional rainfall occurs.



The accompanying illustration shows conditions on the **Brooks-Callaway** operations near Lake Cormorant, Mississippi. The upper picture is taken from the head tower of their Bucyrus-Erie Tower Excavator and looks across the borrow pit toward the tail tower. In the lower view you see their Bucyrus-Erie Class 230 Diesel-electric dragline outside the levee in a flooded borrow pit.

N. R. TUCKER

We are sorry to advise of the death of W. R. Tucker, Greenville, Mississippi. Mr. Tucker had been operating as a sub-contractor on T. W. Roach's work north of Greenville.

Ward-Hayes Construction Company, Birmingham, Alabama, was low bidder on Section 4 of Village Creek. This work involved about 150,000 yards of excavation, about equally divided between earth and solid rock excavation.

The Arundel Corporation is erecting two Bucyrus-Erie Class 230 draglines on their work near New Roads, Louisiana. C. A. Lloyd is in charge of operations.

Oregon Notes

By MARC D. TROYER

I. B. Young, of Portland, was recently awarded contract for 11.5 miles of broken stone and gravel surfacing on the Oregon Coast Highway, Otis-Siletz River Section, Lincoln County.

The Juntura-Peach Section of the Central Oregon Highway, consisting of 6.4 miles of grading in Malheur County, went to **Powell & Gilo,** of Portland.

J. F. Johnston, of Newberg, secured the contract for reconstruction of the south approach to the overcrossing of the Southern Pacific Railroad on the Pacific Highway at Comstock.

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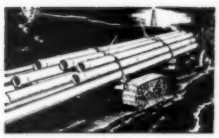

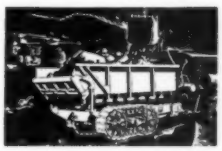

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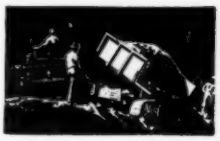
■ It's the superior design and construction of ATHEY TRUSS WHEELS that give ATHEY Units such unusual operating economies. ■ ATHEY'S loose track design requires considerably less drawbar power. The High Truss Track reduces bearing pressures and doubles the life of the track. ATHEYS are quickly re-built to original efficiency with a saving of 75 per cent in track maintenance. Each part has tremendous reserve strength without a pound of surplus weight. ATHEY TRUSS WHEELS last longer, cost less to operate and maintain, are self-cleaning and carry capacity loads under all conditions. ■ ATHEY TRUSS WHEELS are available on more than 100 units, each specifically built to operate quicker and cheaper—stay on the job longer—whether it's hauling dirt, operating in quarries, or transporting heavy machinery, supplies, logs. Write for information.



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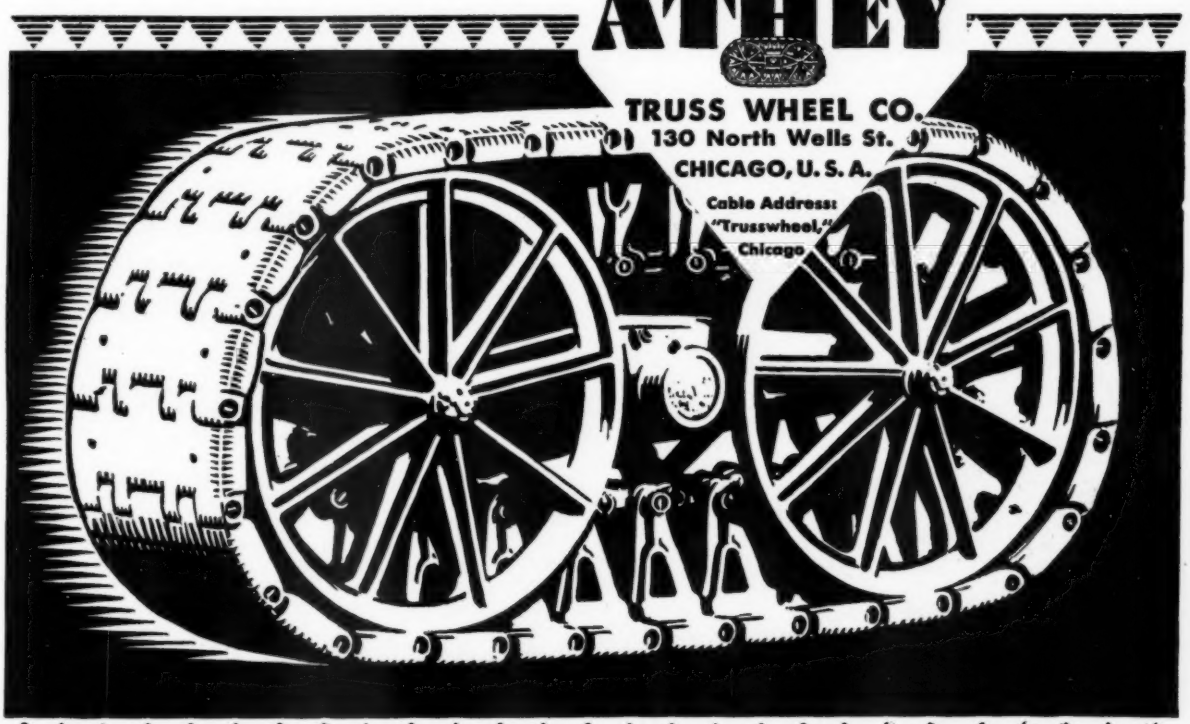
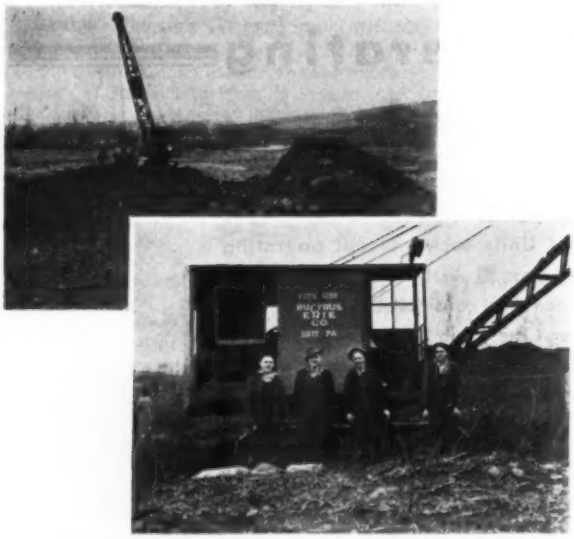


For your convenience in writing to Athey Truss Wheel Co., you will find a card bound in this issue.

Shots From the Firing Line — *Continued*



The above illustrations show the Bucyrus-Erie 1030 shovel owned by the **Dennis Construction Company** of Oswego, operating at Pendleton. They are using the machine for cleaning out the Umatilla River through the city of Pendleton, making a new channel.

The work consisted mainly of digging the channel and placing the material handled—gravel and common—on the bank. They removed approximately 30,000 yards in twenty days, working two eight-hour shifts. This 1030 Bucyrus-Erie dragline is equipped with a 40 foot boom and a ¾-yard Class S Page bucket.

In the lower picture from left to right: C. P. Baggett, oiler, night shift; C. St. Jean, runner, night shift; "Curley" Woods, runner, day shift; C. H. Nestle, oiler, day shift.

Washington Notes

By E. L. BOOTH

Here are two very interesting views of a peculiar accident which happened last summer on a job of Myers & Goulter of Seattle. The scene was a road contract near

Ashford, Washington, in Mt. Rainier National Park. Their Bucyrus-Erie D-2 Diesel was making a side hill cut along a mountain side when a slide from above turned over a fir tree three feet in diameter and 150 feet high. The uprooted tree crashed across the boom and dipper sticks of the shovel. The force was sufficient to snap the trunk of the fir across the boom. The damage consisted of a sprung shipper shaft which had to be replaced, some damage to the cab, a slight bend in one dipper stick although not enough to require a replacement, only slight injury to the operator. Five shifts were lost in getting the shovel "out from under" and making repairs. In the upper picture you can see how the fir put the shovel "up on her nose" and also some of the material from the slide. Great care was required in digging this out, removing the fir, and moving the machine because of danger of starting further slides. How acute was this danger was realized when a new slide came just as the shovel moved out clear of the danger spot.

Redmon-Turner Inc., of Yakima, with their bid of $45,-155.20 were awarded the contract for clearing, grading and draining about 2.5 miles of State Road No. 3, Selah Moxee Tunnel to Yakima, Federal Aid Project No. 105-C in Yakima County, involving about 142,580 cubic yards of excavation, 715 lineal feet of pipe culverts and other items.

Max J. Kuney Company of Spokane was awarded contract for clearing, grading and draining about 12.0 miles of State Road No. 4, Forest Line South, Federal Aid Project No. 177-B in Ferry County, involving about 129 acres of clearing, 321,850 cubic yards of excavation, 106 cubic yards of concrete, 2-reinforced concrete "T" Beam Bridges each 40 feet long, 2,334 lineal feet of pipe culverts and other items. The total amount of the contract was $120,884.06.

To **Myers & Goulter** of Seattle on a bid of $113,195.07 was awarded the contract for clearing, grading and draining about 2.7 miles of State Road No. 5, Clear Fork to South Boundary of Rainier National Park, in Lewis County, involving about 23 acres of clearing, 152,750 cubic yards of excavation, 82 cubic yards of concrete, 2,279 lineal feet of pipe culverts and other items.

San Francisco and Vicinity

By H. L. LIVINGSTON

Merritt, Chapman & Scott, of San Pedro, were low bidders for the rockfill San Gabriel No. 2 to be built for the Los Angeles Flood Control District. This low price was $1,686,-464.00. The principal items on this job are 1,117,000 yards of rockfill and 437,200 yards of excavation on the dam foundation and the cutoff trenches. In addition to this, there will be 24,500 yards of Class A, B, C, and D concrete.

Bids will be received up until March 1 by the City Clerk at Pasadena for the construction of the **Pine Canyon concrete dam** on the San Gabriel River about four miles upstream from Azusa. Virtually all of the leading contractors in the western states are taking out plans for this job, the estimated cost of which will be $10,500,000.00. Principal items are 480,000 cubic yards of concrete and 473,000 yards of excavation.

Granfield, Farrar & Carlin, of San Francisco, who were low bidders to the California Highway Commission for the Cloverdale cutoff job in Mendocino County, are moving a large amount of equipment onto this project in order to complete it in record time. This job, which has 1,250,000 yards of excavation, will be handled by two Bucyrus-Erie Gas+Air shovels, one 43-B, 1¾-yard Diesel shovel, one 20-B steam shovel, one Lorain 75-B and one Lima 101. In addition to this equipment, there will be a large number of Caterpillar 60's and scrapers. Granfield, Farrar & Carlin also have a large highway job in Yosemite Valley which they will move onto as soon as the stormy weather subsides.

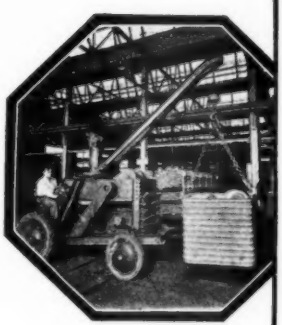
Specifications have been submitted for approval by the Los Angeles Flood Control District to the Engineering Department of the State of California for San Gabriel Dam No. 1. Bids for this project will probably be called for about the end of March. This will be a rock-fill dam with about 3½ million yards of excavation and fill.

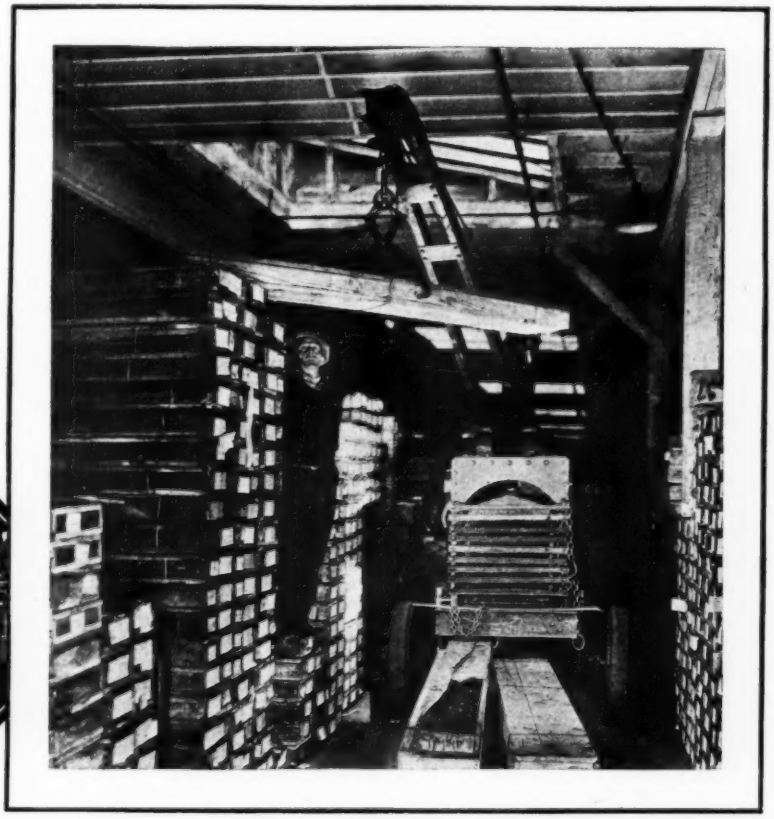
The Nevada Highway Commission has a very extensive road-building program on for the year 1932. Their next big job coming up is the grading and surfacing in Clark County of 10.58 miles of highway. This will involve the excavation of 500,000 yards of highway material.

The J. P. Holland Company is making exceptionally rapid progress on their California Highway job out of San Bernardino, California, and hope to be ready to move to new jobs by April 1st.

Are you satisfied

. . . . with your present material handling methods?





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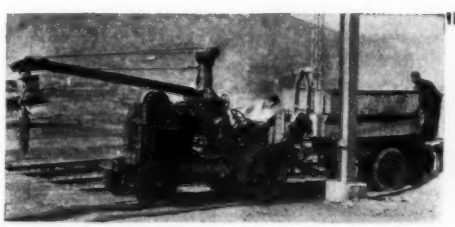

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Building the Test Section of Liberty Highway

(Continued from Page 133)

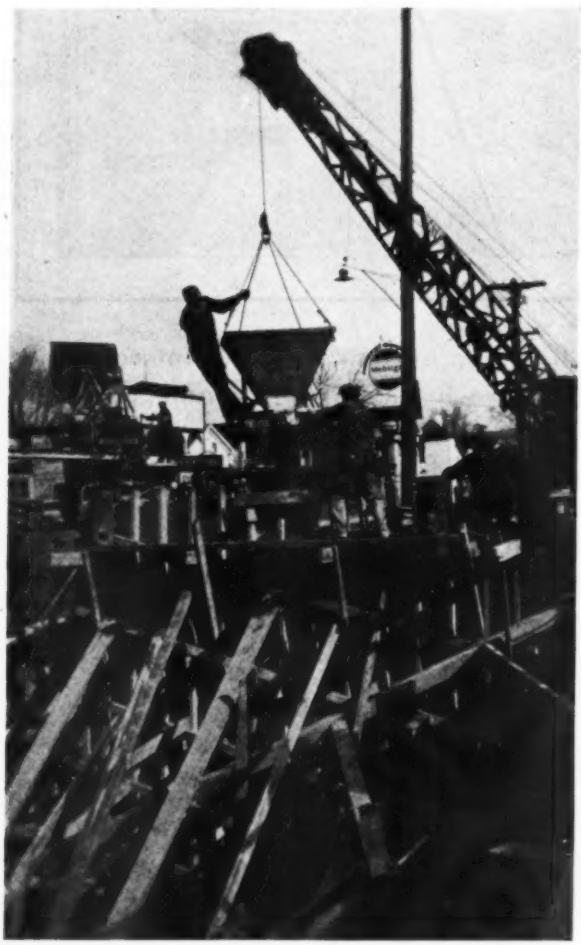
operated by a Type B Bucyrus-Erie steam crane was used. The same outfit drove the thirty-five timber piles, and the batter piles used in the foundation.

The Type B also did the excavating for the creek channel changes, as well as driving over 7000 feet of timber piling and 3000 feet of sheet piling.

The aggregates for the concrete were weighed out at Randolph and hauled to the Foote 21-E mixer in single batch dump body trucks. The mixed concrete was dumped into an Insley concrete car which was, in turn, picked up by the 1035 crane and dumped into the spouts at the forms.

Trucks and Trailers Haul Twenty-ton Girders Seventy Miles

The steel was hauled by truck from Buffalo. Each of the twenty-ton steel girders, which were seventy-eight feet long and eight feet high, was carried by a truck and trailer. A heavy truck carrying some of the lighter members followed each girder to help on the steep grades of which there were several on the route. This was the first time large girders were ever transported by truck for any long distance in Western New York. It took the fleet three days to cover the seventy miles.



The Bucyrus-Erie 1035 crane and Insley 22 cubic foot car were used in pouring concrete into the bridge forms. 30 cubic yards per hour was regular production. Each abutment contained 330 cubic yards.

When the girders arrived, they were lifted from the trucks and placed by the Marion gas-electric and the Bucyrus-Erie 1035. After the girders were in place, the 1035 was brought up on the bank where she finished the steel erection.

Heating for Winter Work

Cold weather had set in by the time the steel work was completed, making it necessary to provide protection against the freezing, for the remaining concrete to be poured in the back walls, floor slab, wearing course, etc.

Three one-inch steam jets inserted into the aggregate bins brought the temperature of those materials to over 120° F. A steam jet inserted in a forty gallon water tank furnished hot water. The concrete going into the forms, after being hauled for two miles, averaged about 92° F.

The entire bridge structure was enclosed in a house of canvas and burlap and heated by salamanders. Inside this great tent the men worked in comfort while completing the slab, sidewalks, curb and gutter, and four inch wearing surface.

The entire bridge was constructed in two months.

The State officials were very well satisfied with the progress and complimented Mr. Knickenberg on his fine equipment which never faltered once. In fact, there was not even a cable reported broken on this job, which speaks very well for the men in charge as well as the operators.

The job was under the direct supervision of H. H. Murphy, general superintendent for Peter J. Knickenberg, and Walter J. O'Brien, was resident engineer for the State of New York.

Progress on the Intracoastal Waterway

(Continued from Page 135)

It is estimated that the Sabine River—Galveston Bay Section may be opened for traffic in 1933.

All preliminary survey work has been completed and local interests have been furnished necessary maps for securing rights-of-way and spoil disposal areas from Galveston Bay to Corpus Christi. It is understood that local interests are actively engaged in securing rights-of-way and spoil disposal areas but no deeds have as yet been submitted to Engineer Department.

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Steel corner brackets extend well beyond the backs of the scoops, giving added digging leverage and a permanently "wabble proof" connection between the scoops and "A"-frame. *Write for bulletin.*

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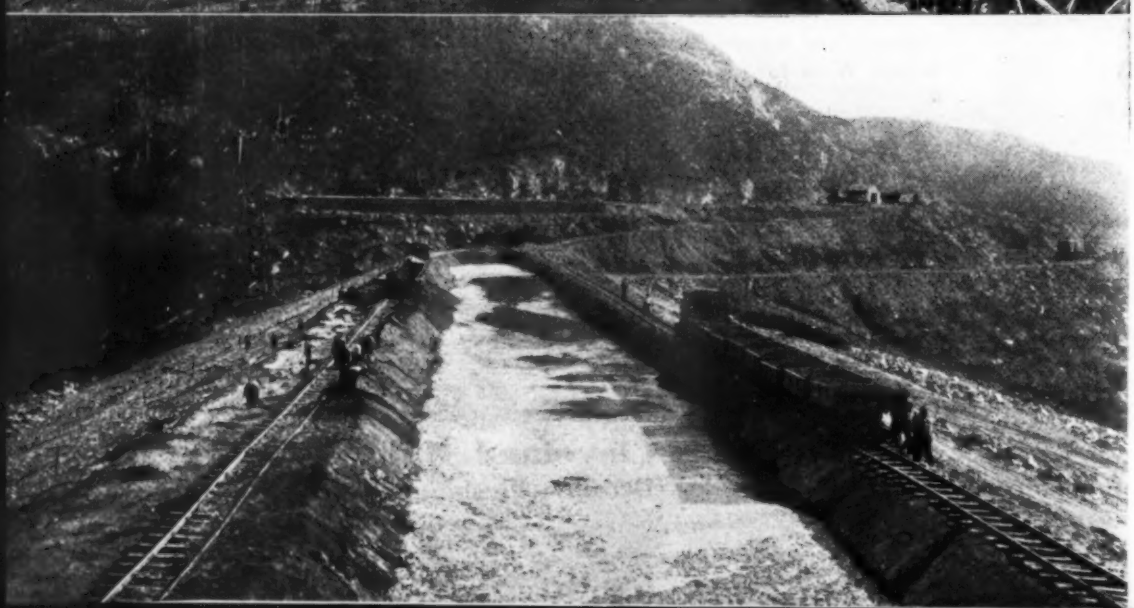
Sluicing at the dam. In the bottom right corner can be seen a portion of one of the pontoons to float the core pool pumps.

Note discharge of material from the mud line at the left. Shear boards guiding the flow. Dragline building the dike.



Topping of the dam with car operation above the maximum water elevation in the reservoir.